

FIG. 4

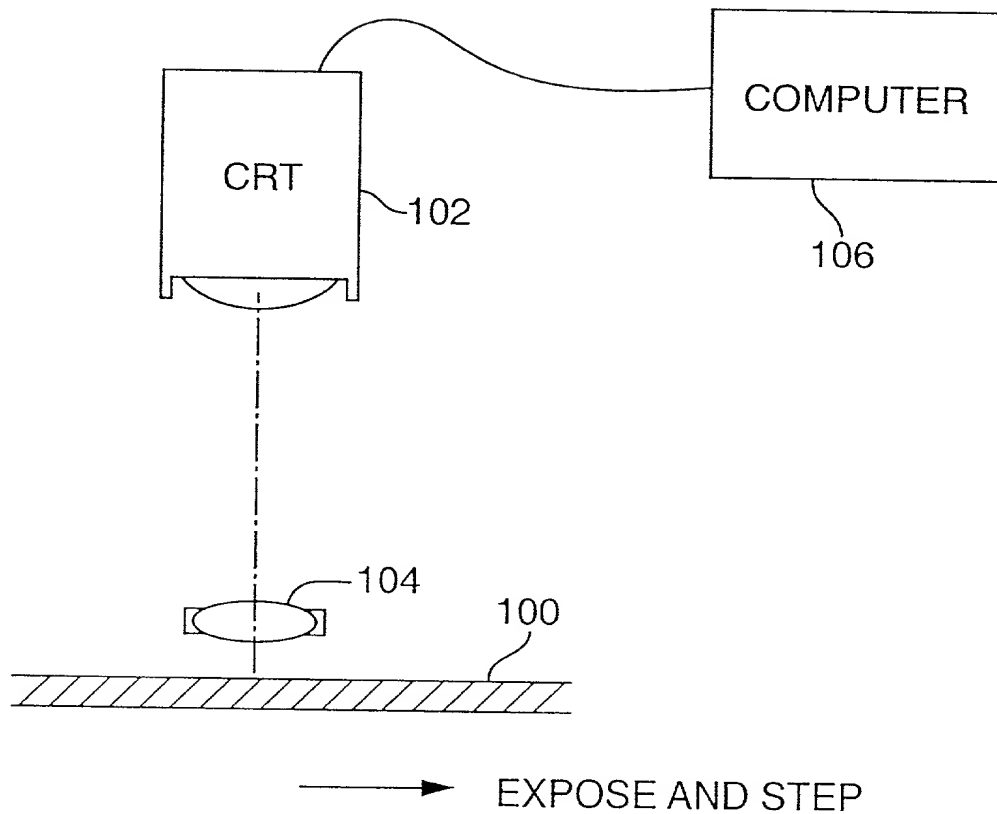


FIG. 1

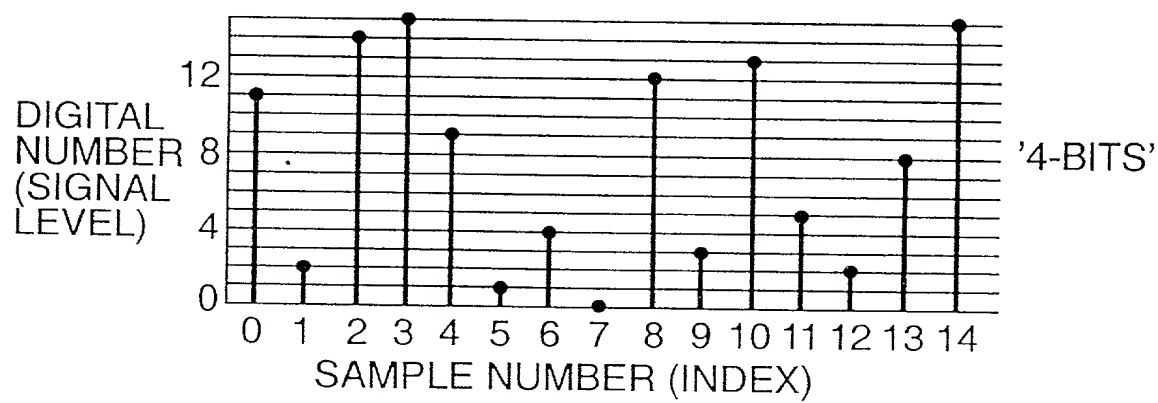


FIG. 2

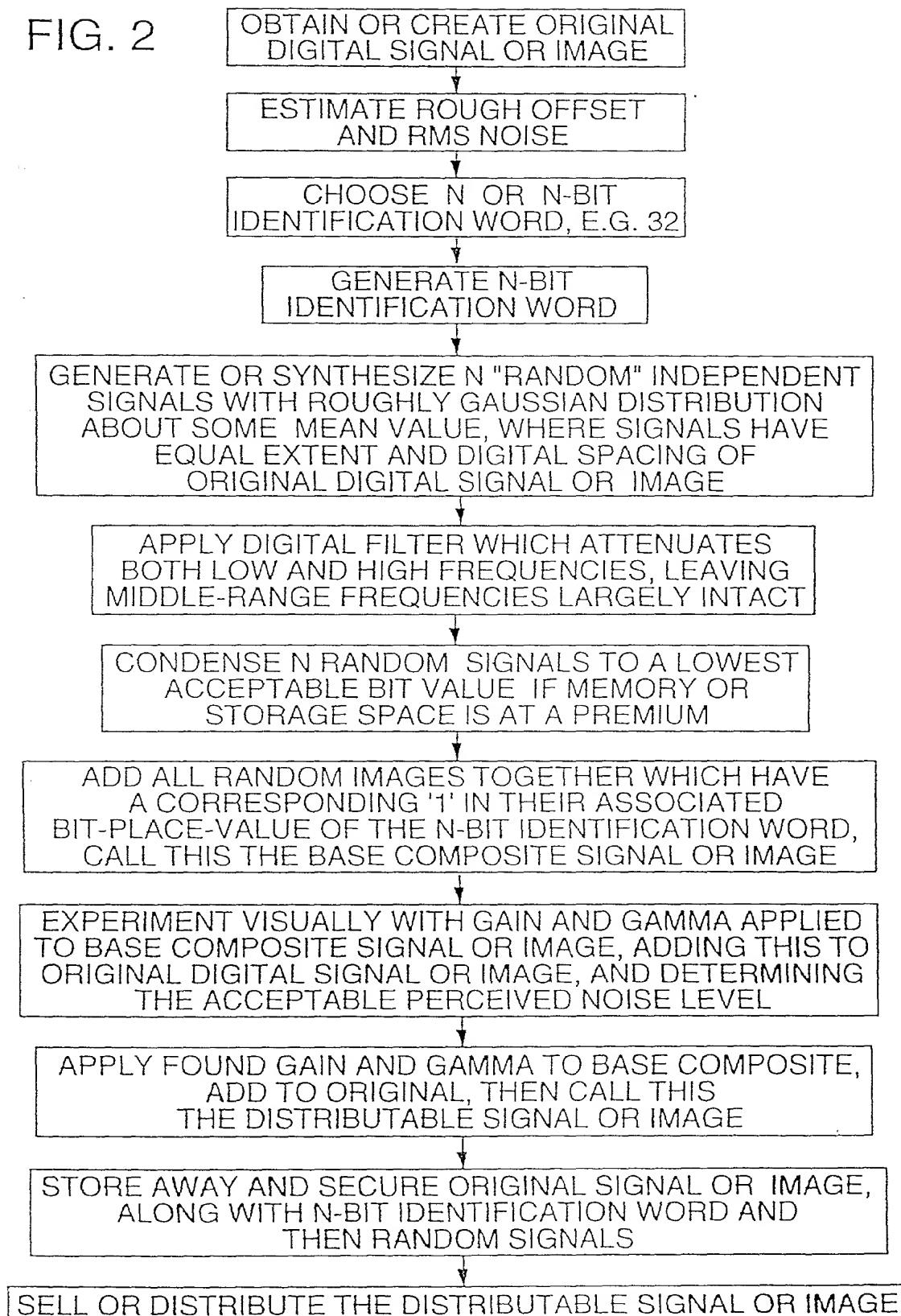


FIG. 3

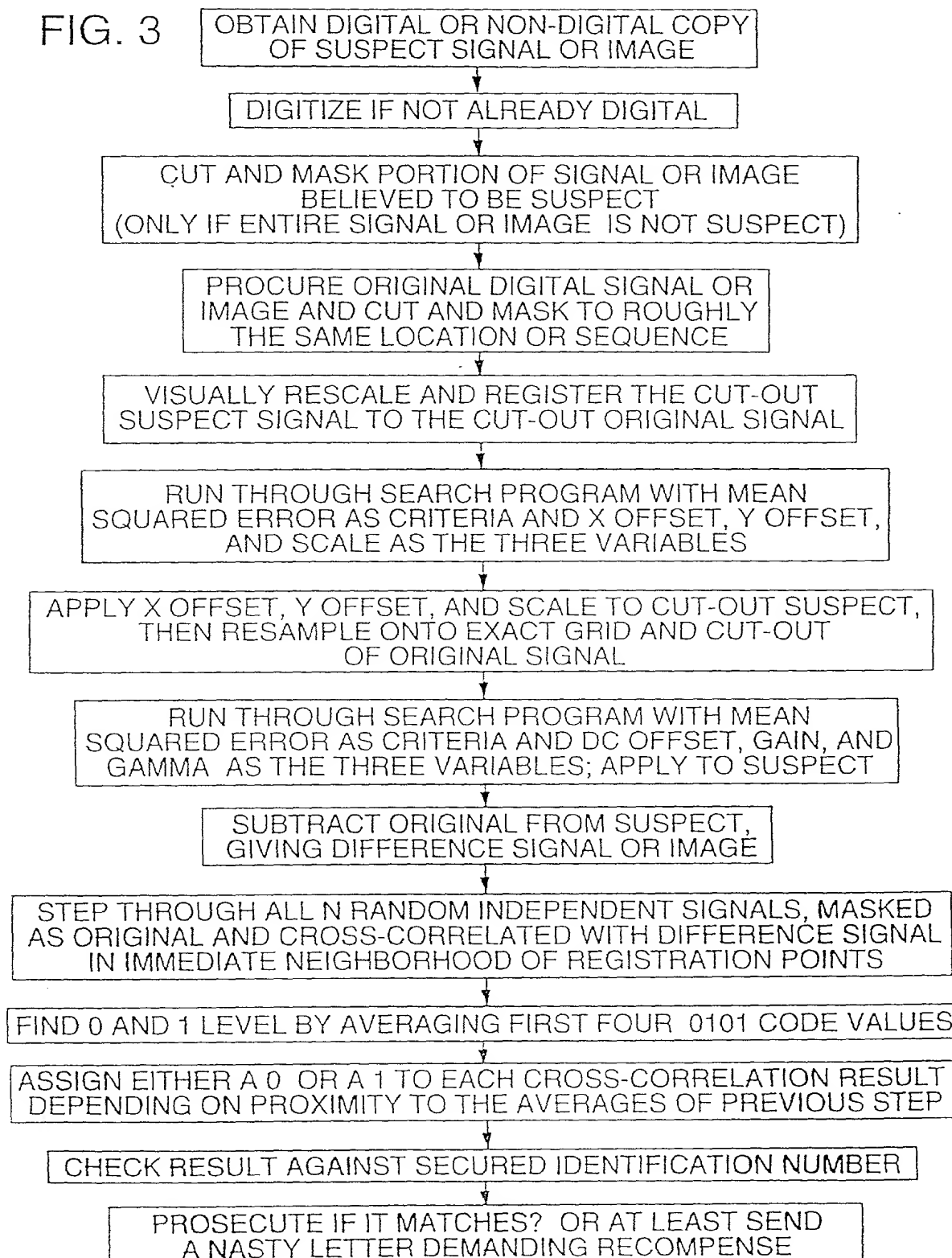


FIG. 5

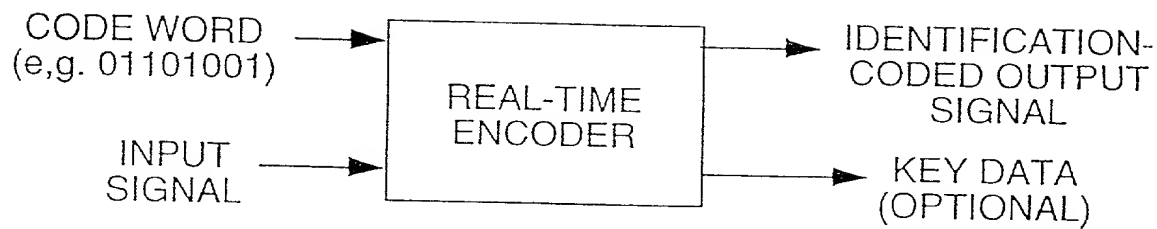
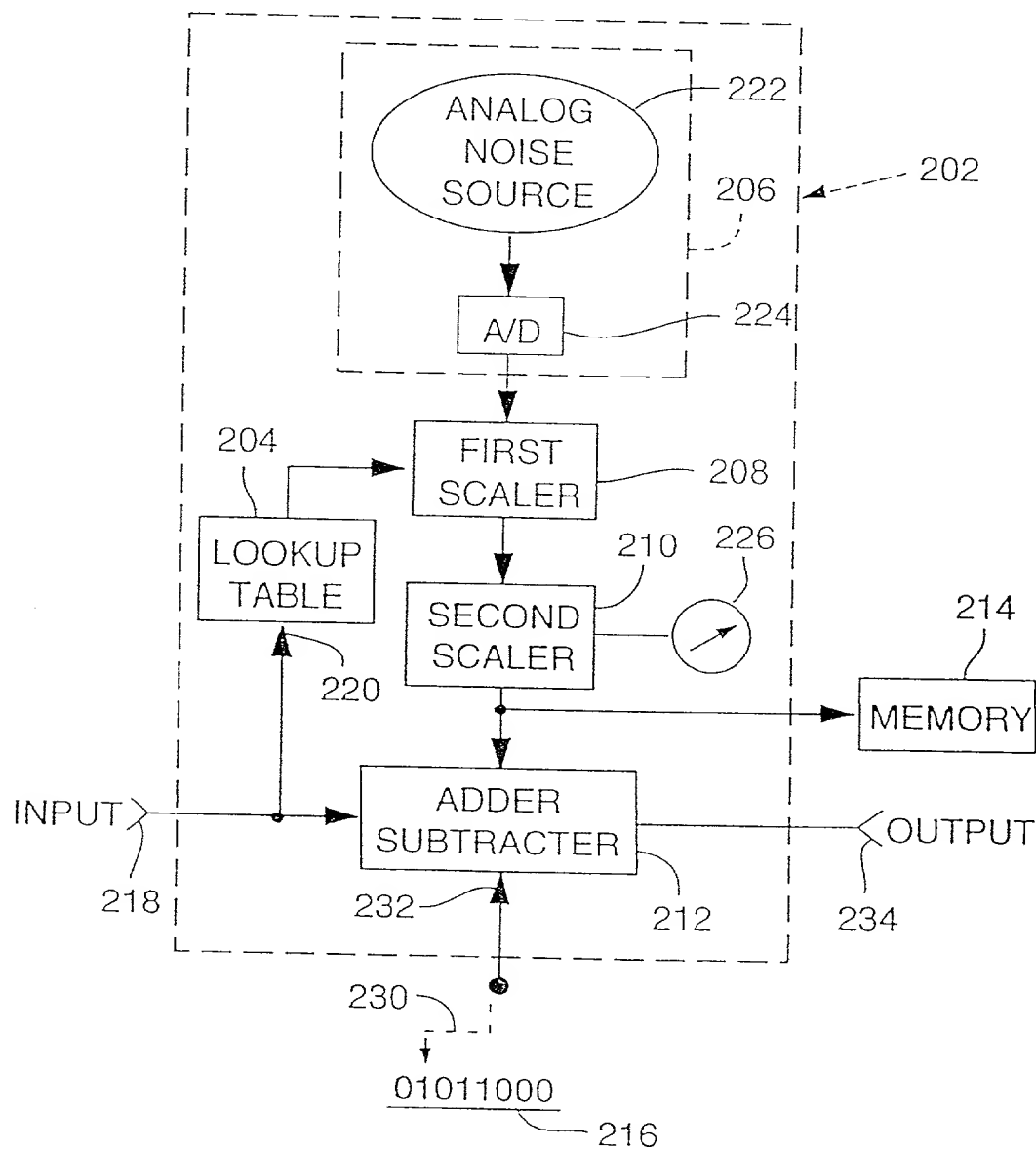


FIG. 6



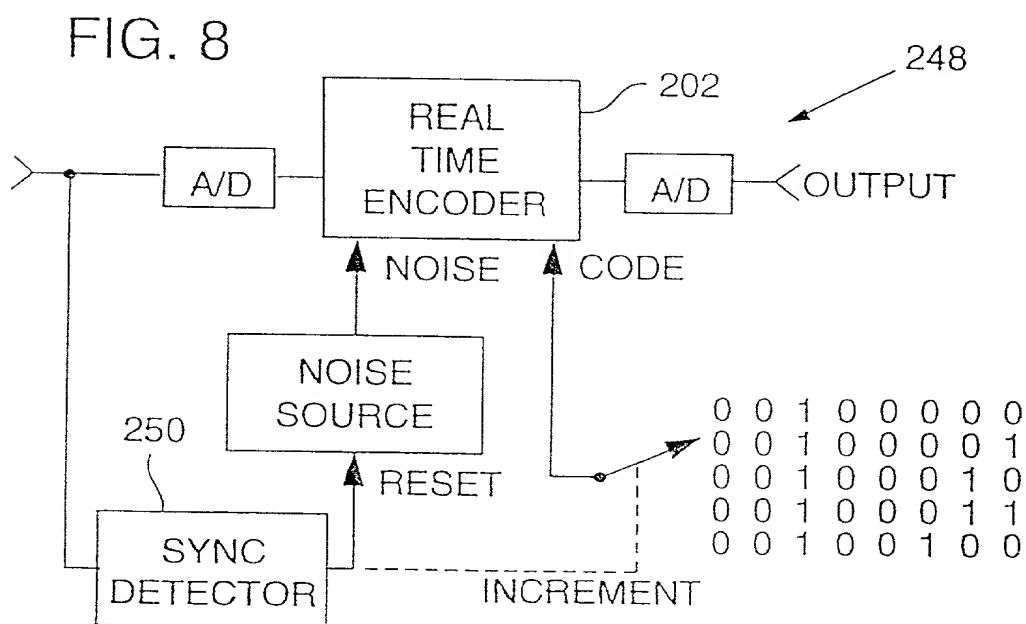
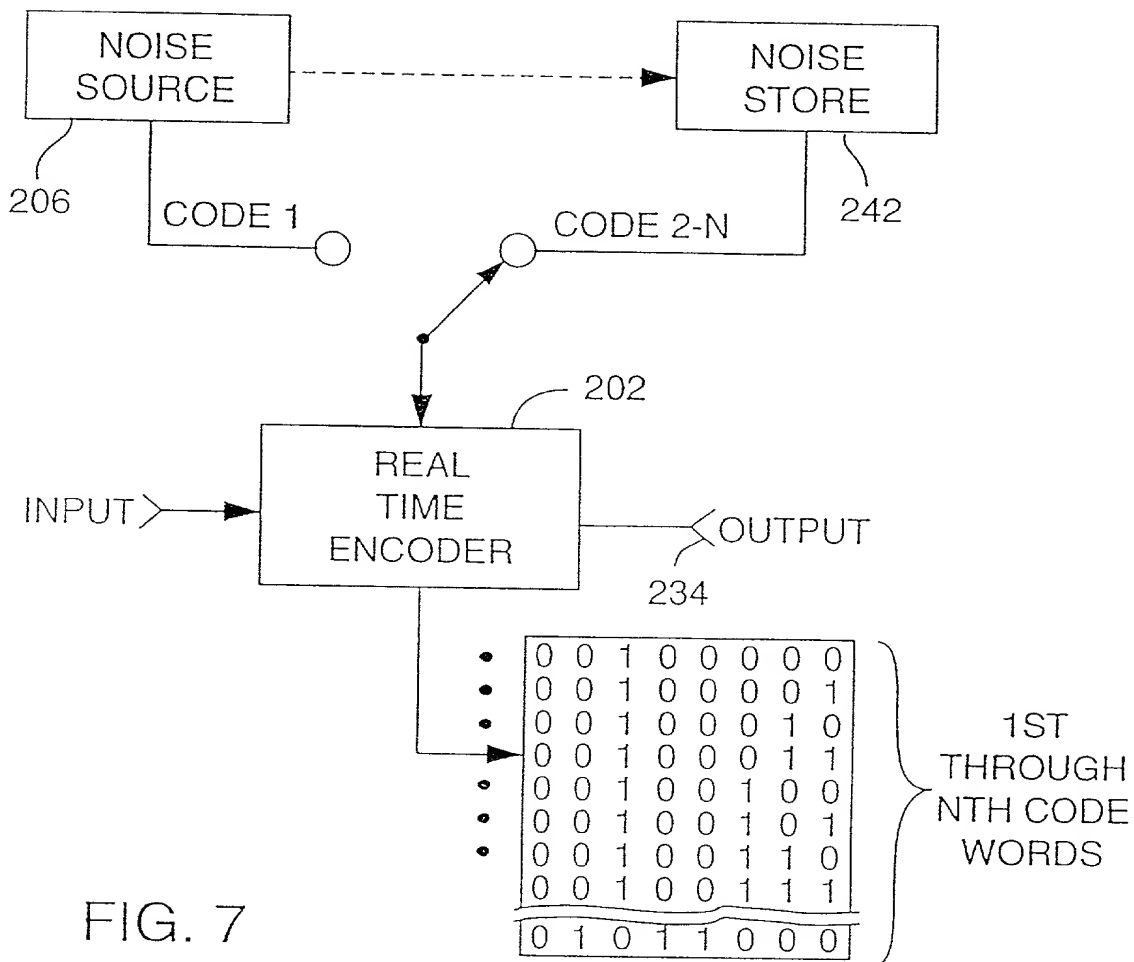


FIG. 9A

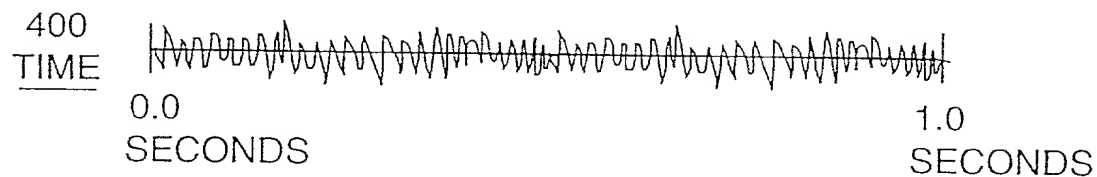


FIG. 9B

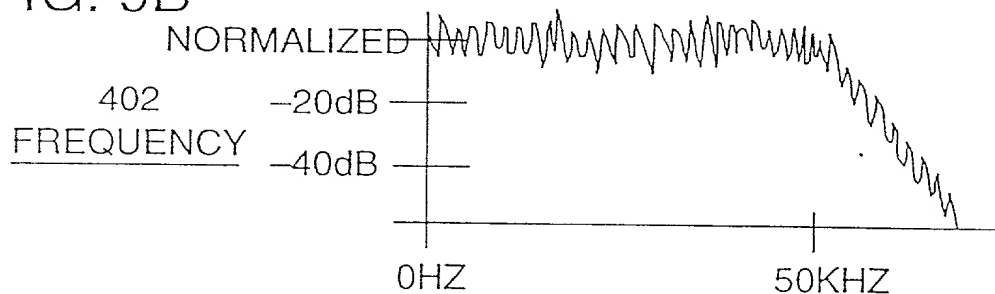


FIG. 9C

BORDER
CONTINUITY
404

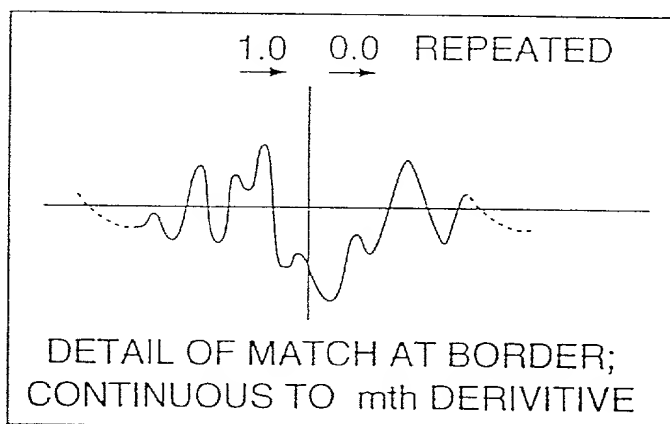


FIG. 10

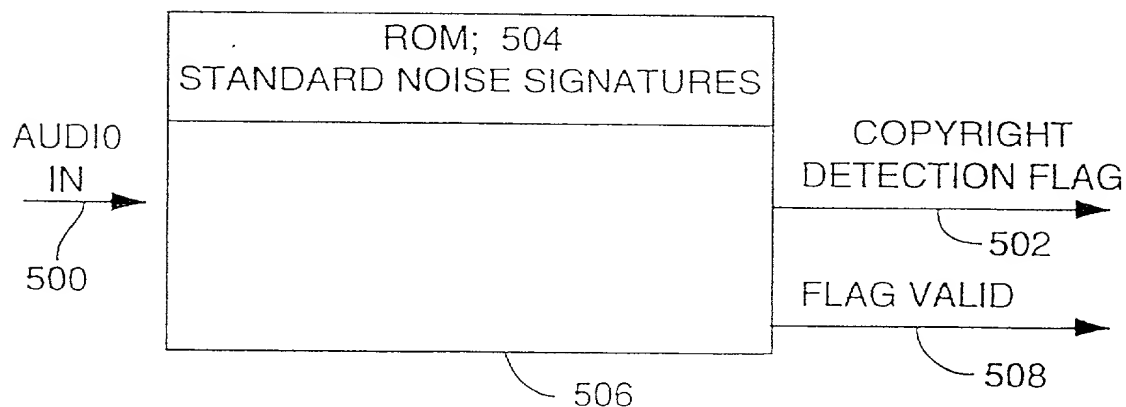


FIG. 11

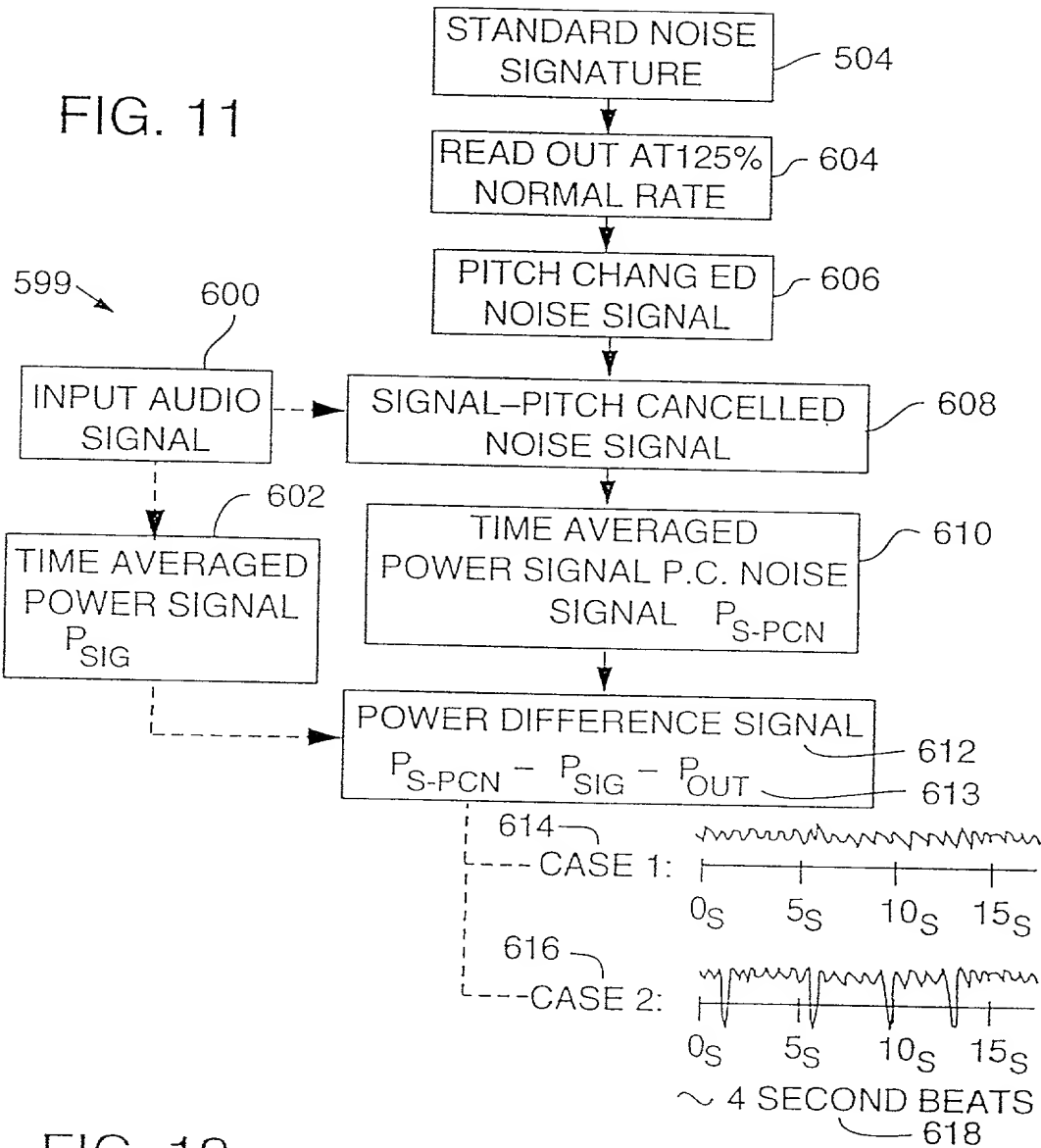


FIG. 12

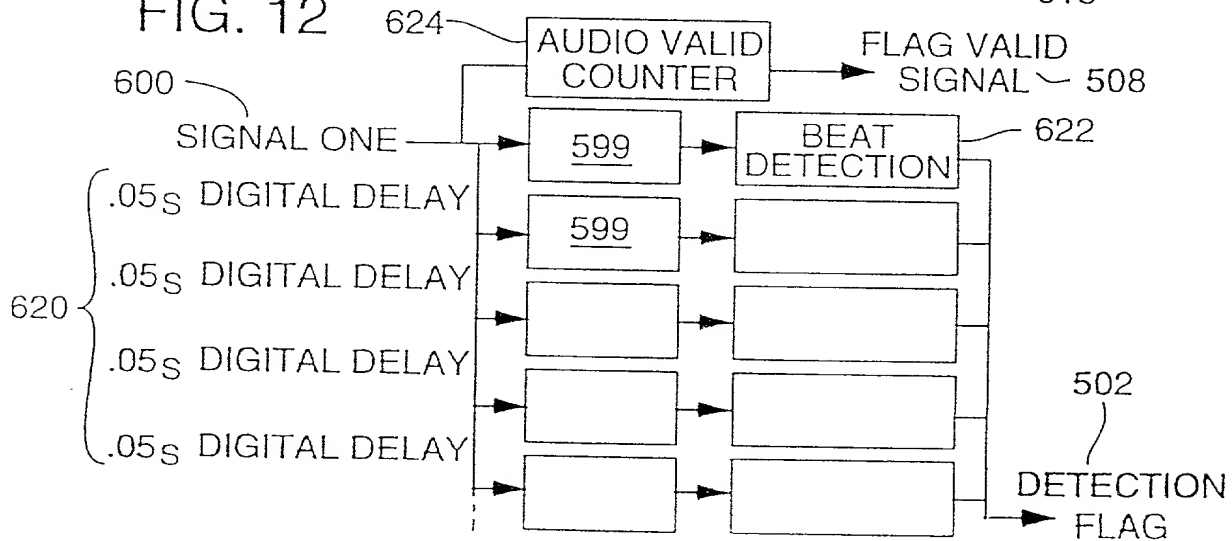
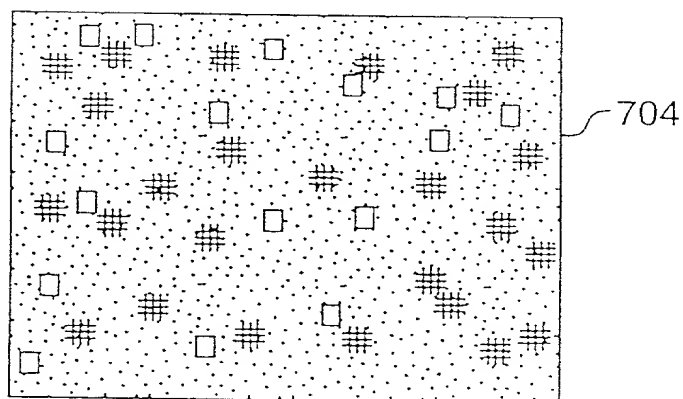
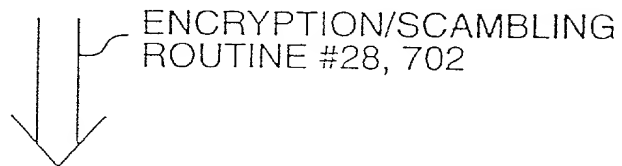
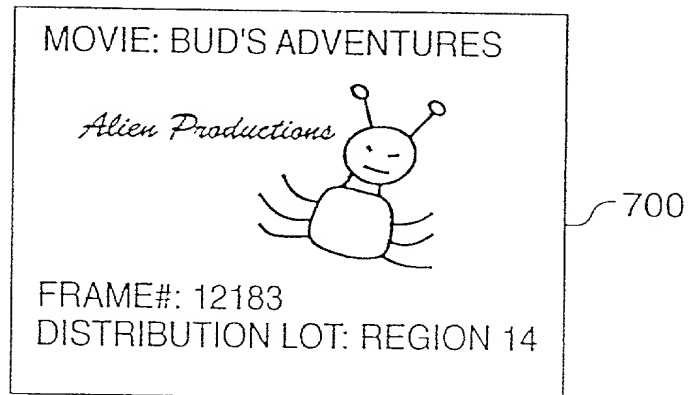
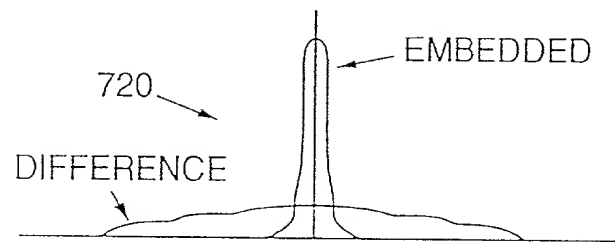


FIG. 13

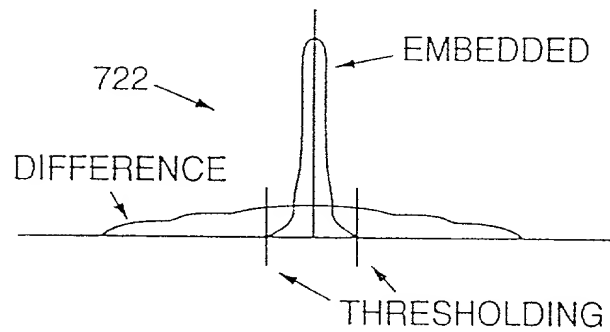


PSEUDO-RANDOM MASTER SNOWY IMAGE
(SCALED DOWN AND ADDED TO FRAME 12183)

FIG. 14



MEAN-REMOVED HISTOGRAMS OF
DIFFERENCE SIGNAL AND KNOWN EMBEDDED
CODE SIGNAL



MEAN-REMOVED HISTOGRAMS OF
FIRST DERIVATIVES (OR SCALAR GRADIENTS
IN CASE OF AN IMAGE)

FIG. 15

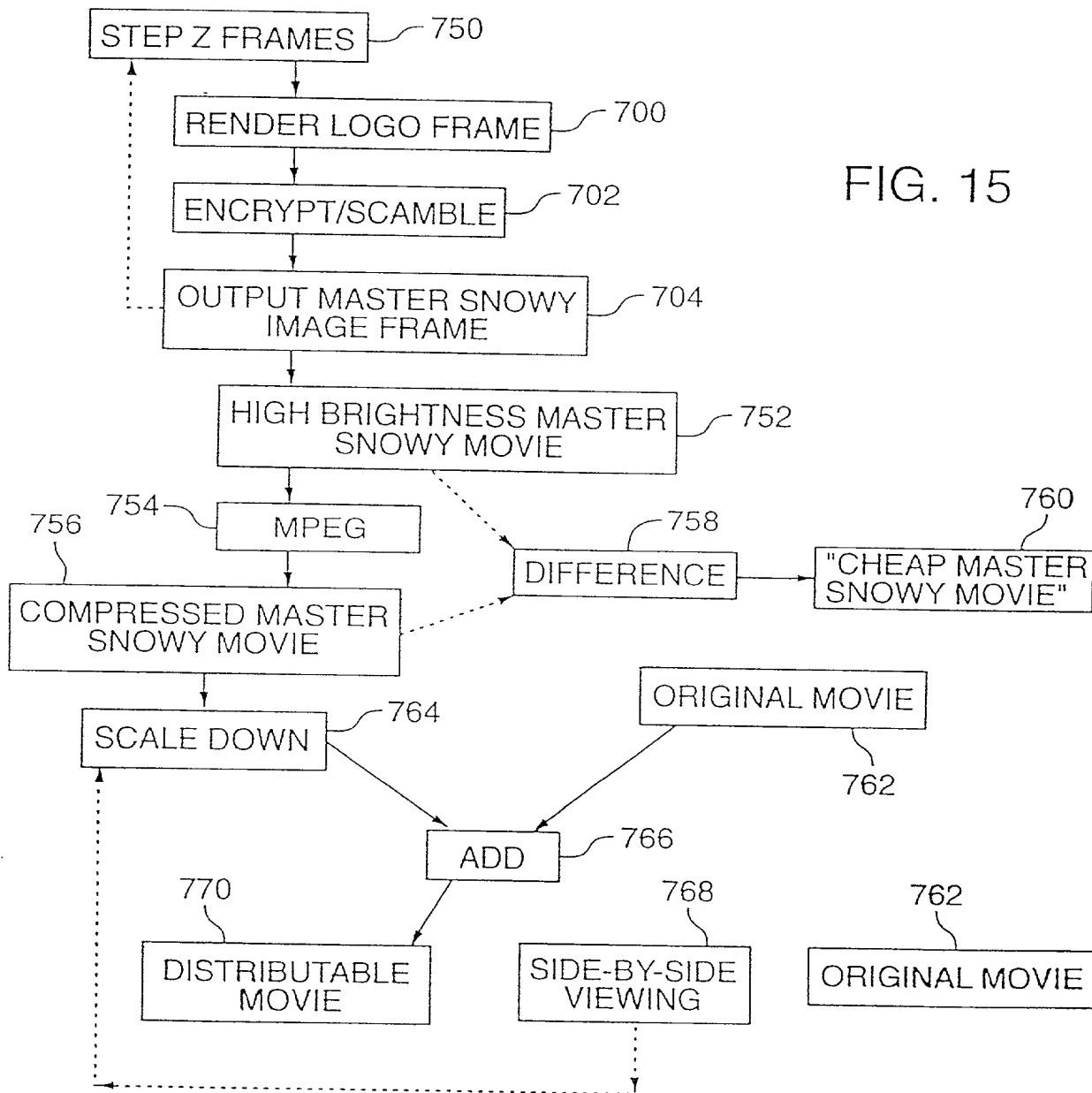


FIG. 16

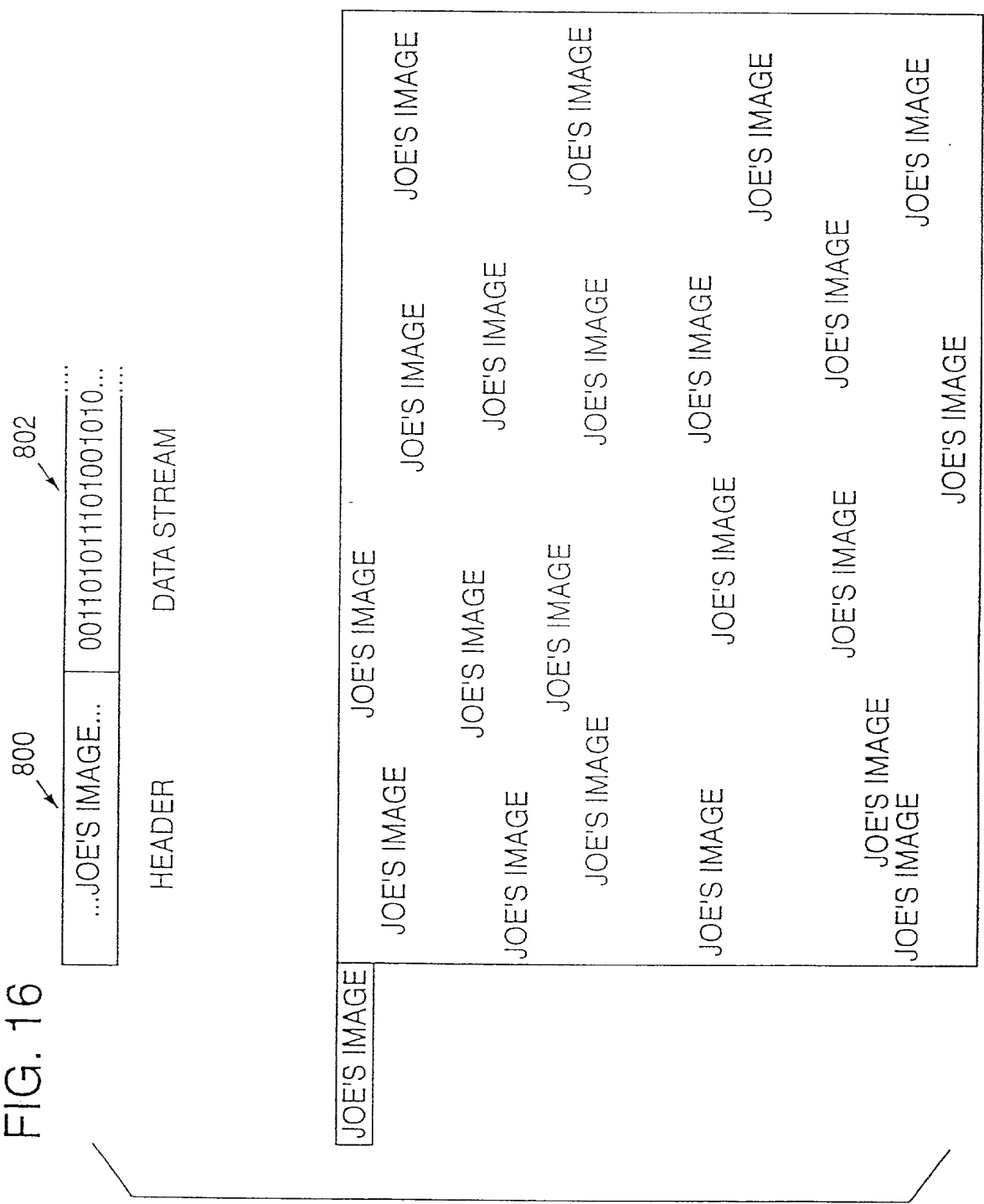


FIG. 17

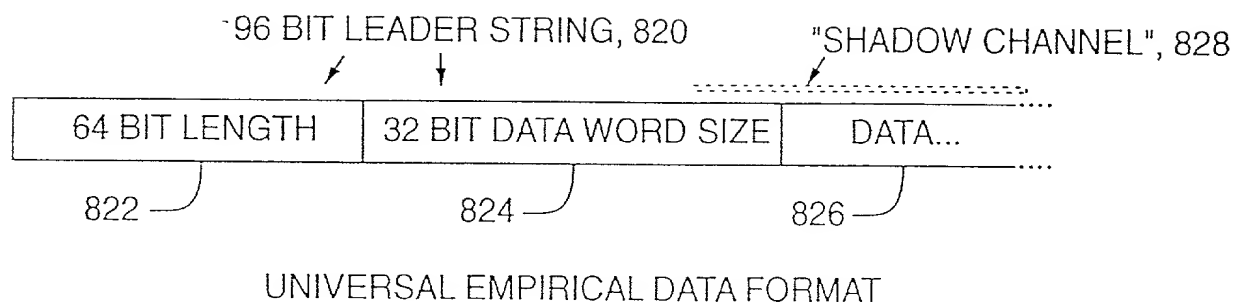


FIG. 18

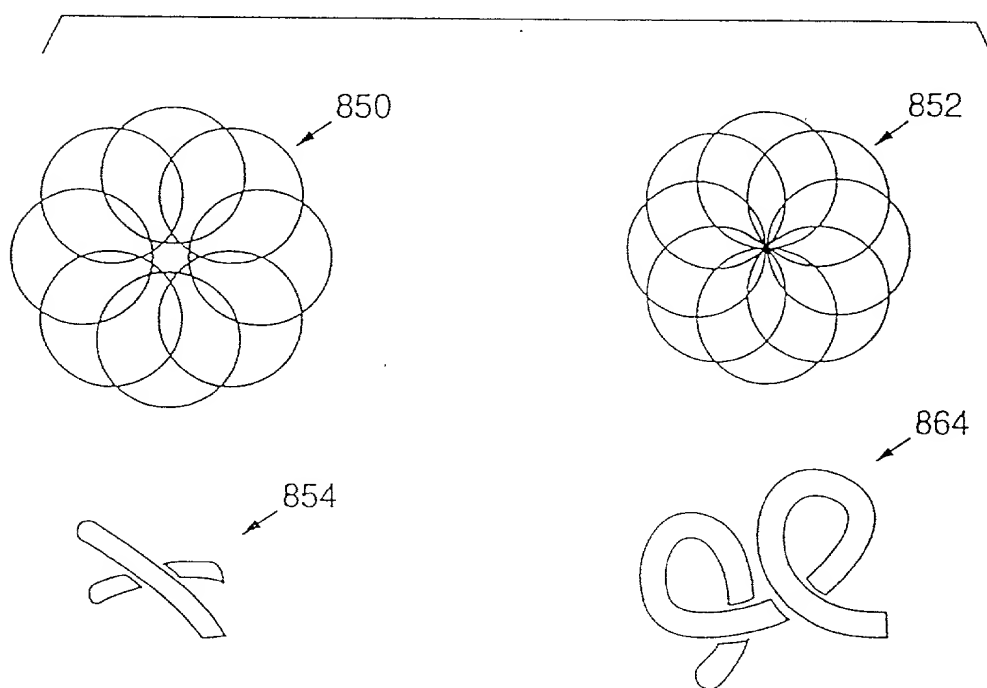
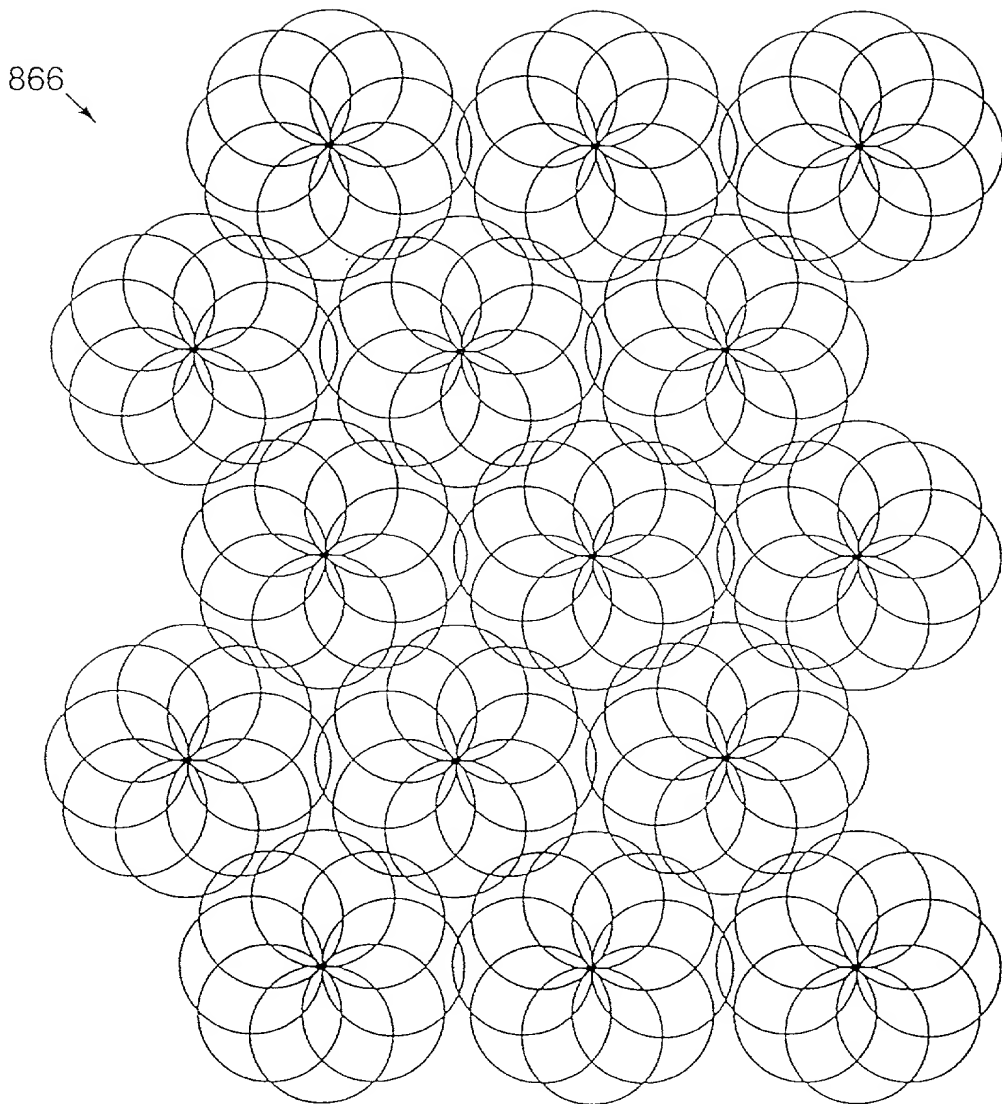


FIG. 19



QUEST FOR MOSAICED KNOT PATTERNS WHICH "COVER" AND
ARE COEXTENSIVE WITH ORIGINAL IMAGE;
ALL ELEMENTAL KNOT PATTERNS CAN CONVEY THE SAME
INFORMATION, SUCH AS A SIGNATURE, OR EACH CAN CONVEY A
NEW MESSAGE IN A STEGANOGRAPHIC SENSE

FIG. 20

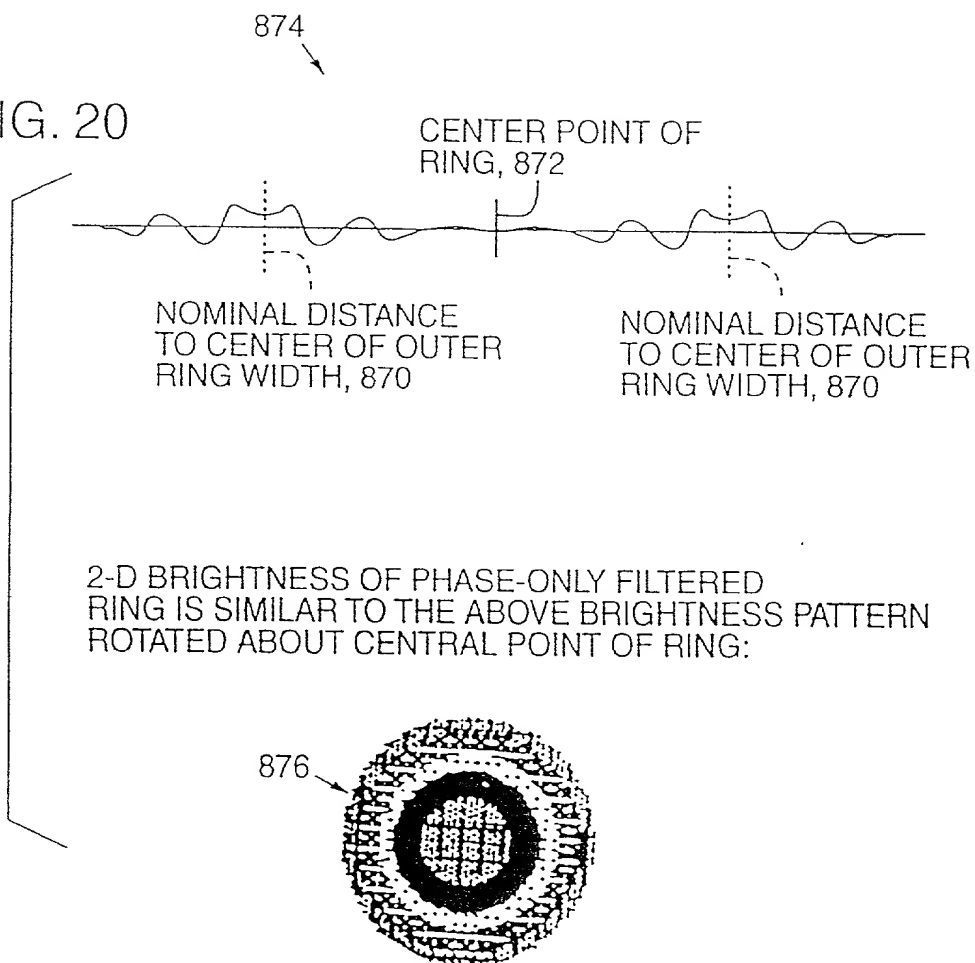


FIG. 21A

900 →

C	2C	C
2C	4C	2C
C	2C	C

WHERE $C = 1/16$

ELEMENTARY BUMP
(DEFINED GROUPING OF PIXELS WITH
WEIGHT VALUES)

FIG. 21B

...
...	2	...	3	...	4	...	5	...	6	...	7	...	0	...
...
...	6	...	7	...	0	...	1	...	2	...	3	...	4	...
...	...	...	...	...	C	2C	C	...	...	...	...	...	...	...
...	2	...	3	...	4	2C	4C	2C	6	...	7	...	0	...
...	...	...	...	...	C	2C	C	...	...	...	...	...	...	...
...	6	...	7	...	0	...	1	...	2	...	3	...	4	...
...
...

EXAMPLE OF HOW MANY ELEMENTARY BUMPS, 900, WOULD BE ASSIGNED LOCATIONS IN AN IMAGE, AND THOSE LOCATIONS WOULD BE ASSOCIATED WITH A CORRESPONDING BIT PLANE IN THE N-BIT WORD, HERE TAKEN AS $N=8$ WITH INDEXES OF 0-7. ONE LOCATION, ASSOCIATED WITH BIT PLANE "5", HAS THE OVERLAY OF THE BUMP PROFILE DEPICTED.

FIG. 22 is a schematic diagram of a system for processing a digital image of a customer's head and printing the processed image onto a plastic card. The system includes a digital camera (940) that captures a digital image of a customer's head (940). The digital image is then processed by a computer (942) to create a new encoded image. The processed image is then printed onto a plastic card (950). The plastic card (950) includes a printed image of the customer's head (952) and a printed image of the customer's head (954). The printed image of the customer's head (952) is a digital image of the customer's head (940) that has been processed by the computer (942). The printed image of the customer's head (954) is a printed image of the customer's head (940) that has been processed by the computer (942).

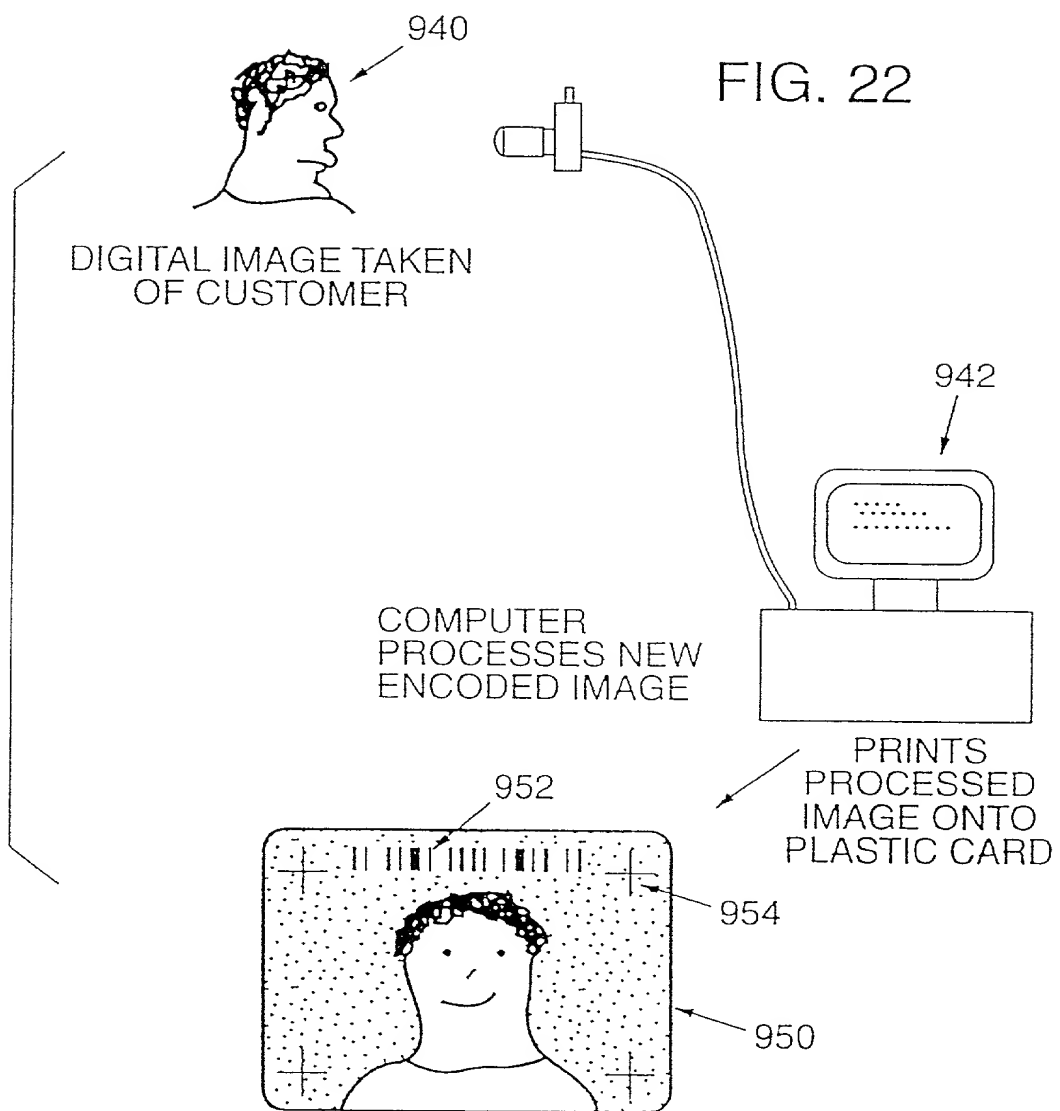
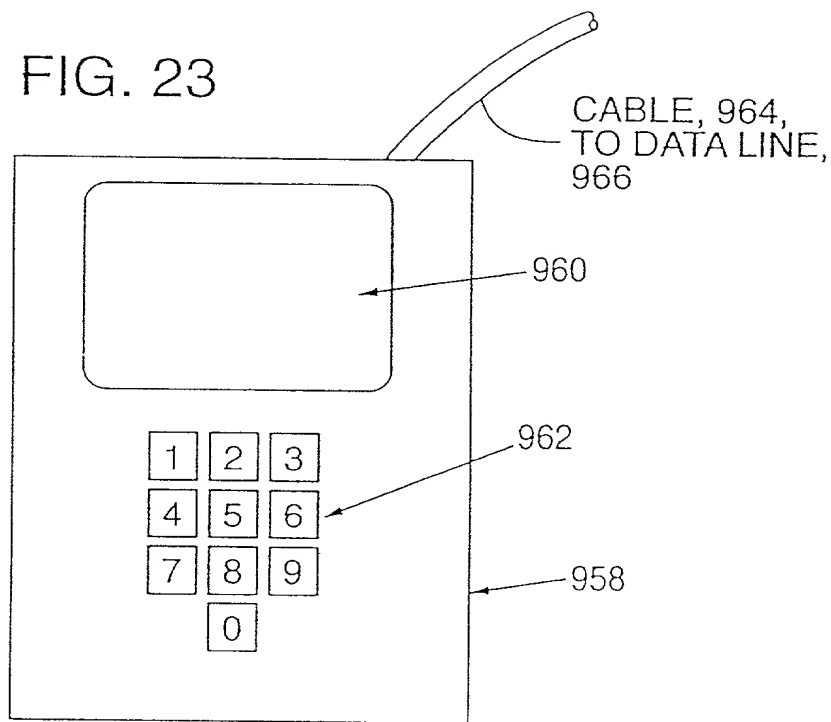


FIG. 23



CONTAINS RUDIMENTARY OPTICAL SCANNER,
MEMORY BUFFERS, COMMUNICATIONS DEVICES,
AND MICROPROCESSOR

CONSUMER MERELY PLACES CARD INTO WINDOW
AND CAN, AT THEIR PREARRANGED OPTION, EITHER
TYPE IN A PERSONAL IDENTIFICATION NUMBER
(PIN, FOR ADDED SECURITY) OR NOT. THE TRANSACTION
IS APPROVED OR DISAPPROVED WITHIN SECONDS.

FIG. 24

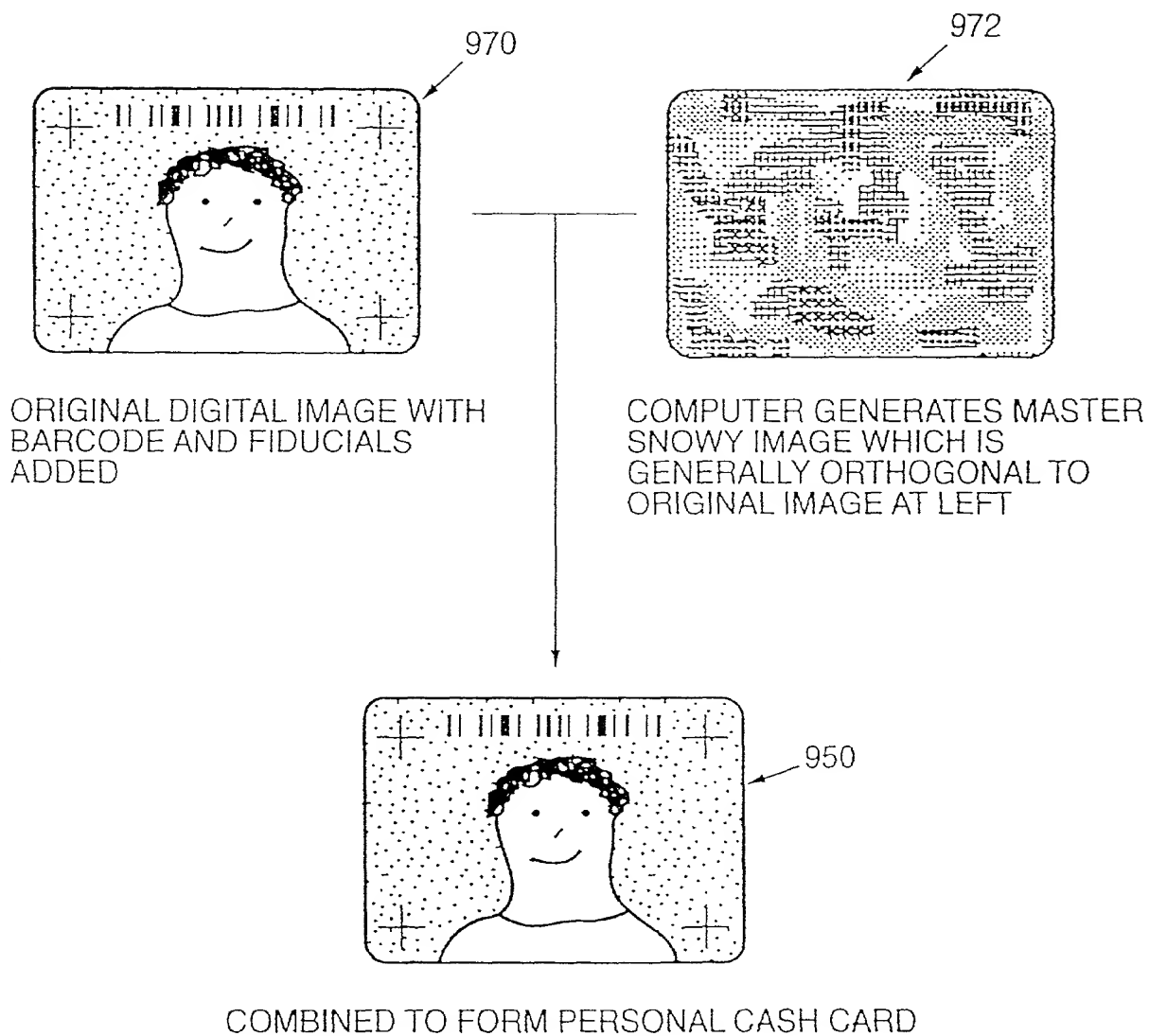
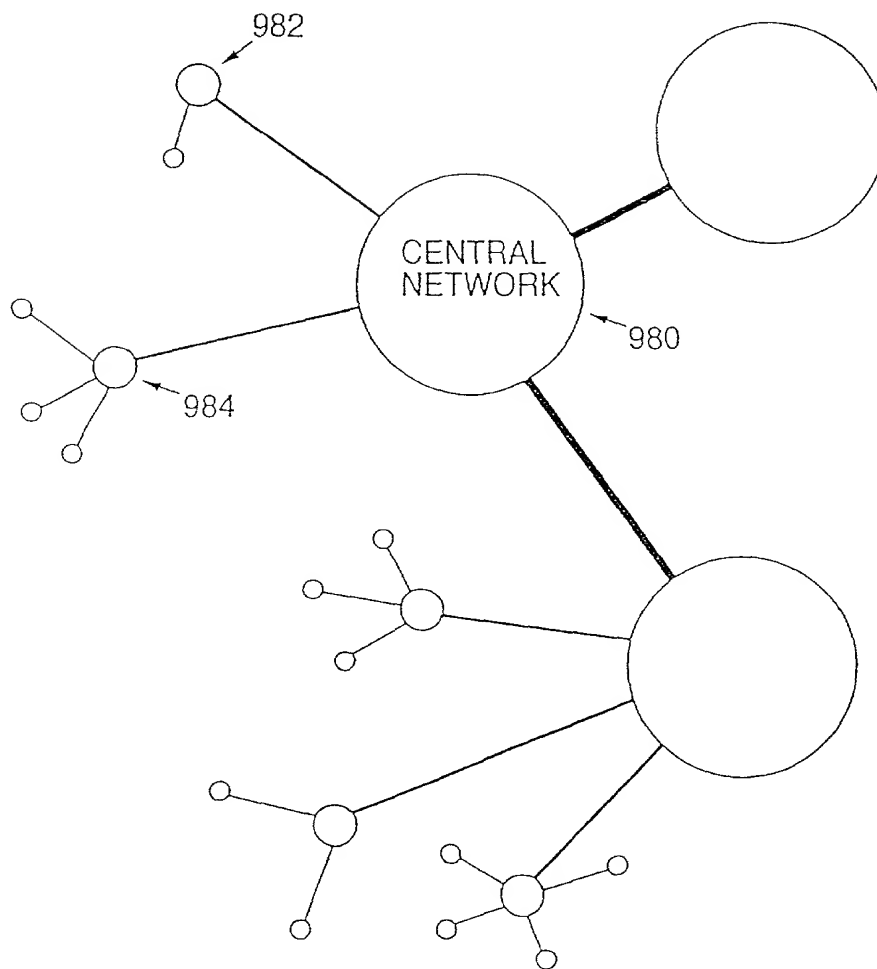


FIG. 26

THE NEGLIGIBLE-FRAUD CASH CARD SYSTEM



A BASIC FOUNDATION OF THE CASH CARD SYSTEM IS A 24-HOUR INFORMATION NETWORK, WHERE BOTH THE STATIONS WHICH CREATE THE PHYSICAL CASH CARDS, 950, AND THE POINT-OF-SALES, 984, ARE ALL HOOKED UP TO THE SAME NETWORK CONTINUOUSLY

FIG. 27 is a block diagram of a system for creating and displaying a web site. The system includes a web site development tool (1008) that creates a web site (1006). The web site (1006) is displayed on a browser (1010) via the Internet (1012). The web site (1006) includes a home button (HO) and a search button (1002).

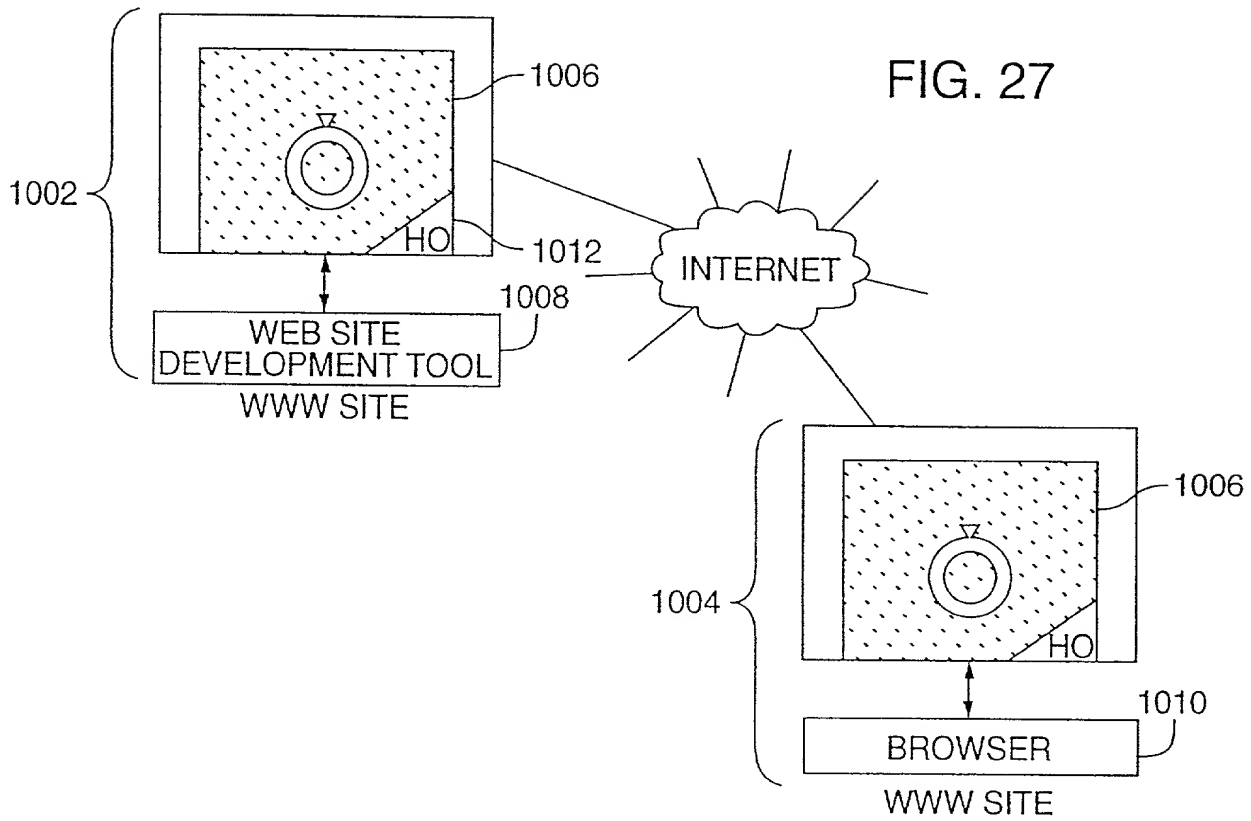


FIG. 28

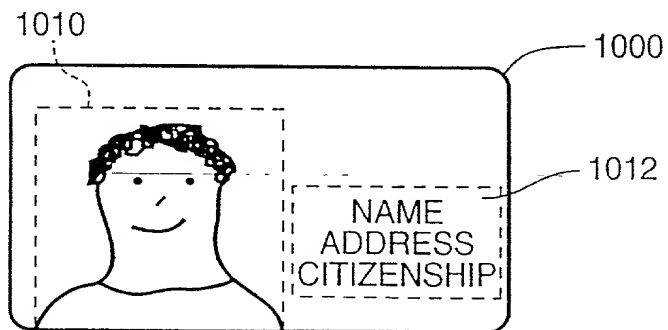


FIG. 27A

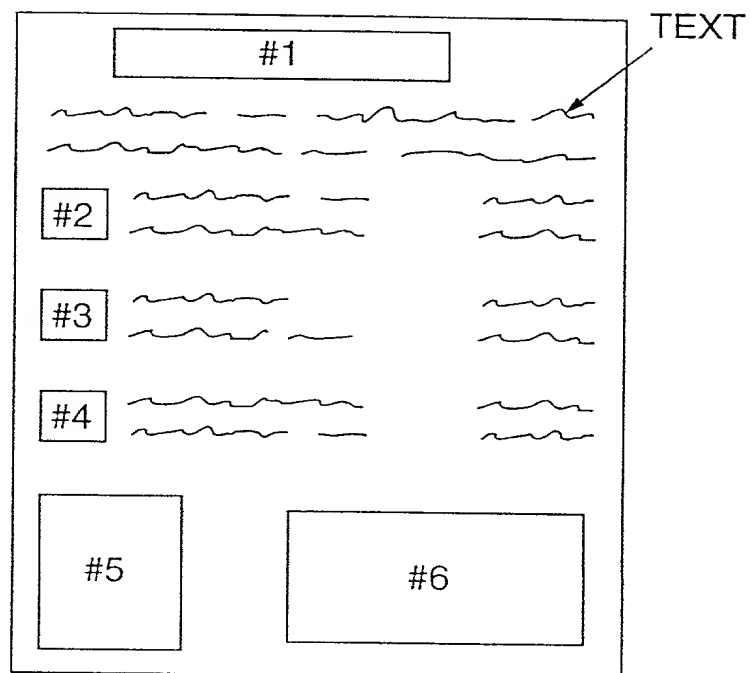


FIG. 27B

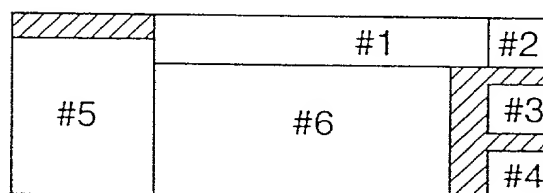
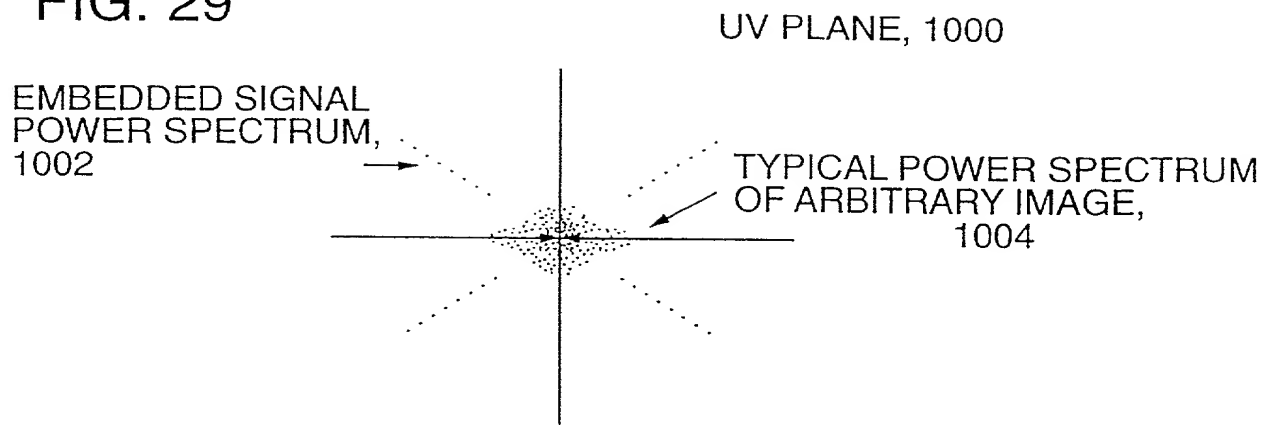
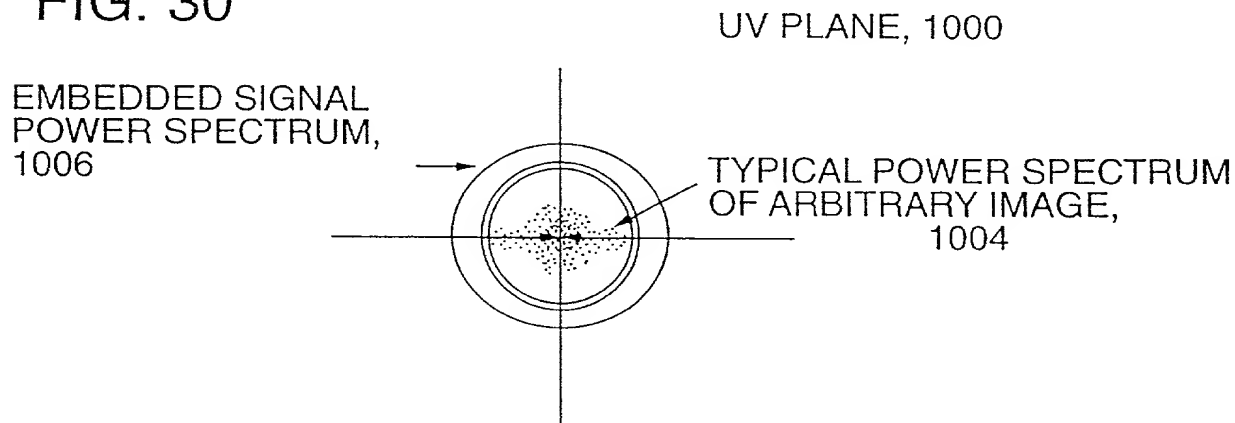


FIG. 29



NON-HARMONIC SPATIAL FREQUENCIES ALONG THE 45 DEGREE AXES, GIVING RISE TO A WEAWE-LIKE CROSS-HATCHING PATTERN IN THE SPATIAL DOMAIN

FIG. 30



NON-HARMONIC CONCENTRIC CIRCLES IN UV PLANE, WHERE PHASE HOPS QUASI-RANDOMLY ALONG EACH CIRCLE, GIVING RISE TO PSEUDO RANDOM LOOKING PATTERNS IN THE SPATIAL DOMAIN

FIG. 29A

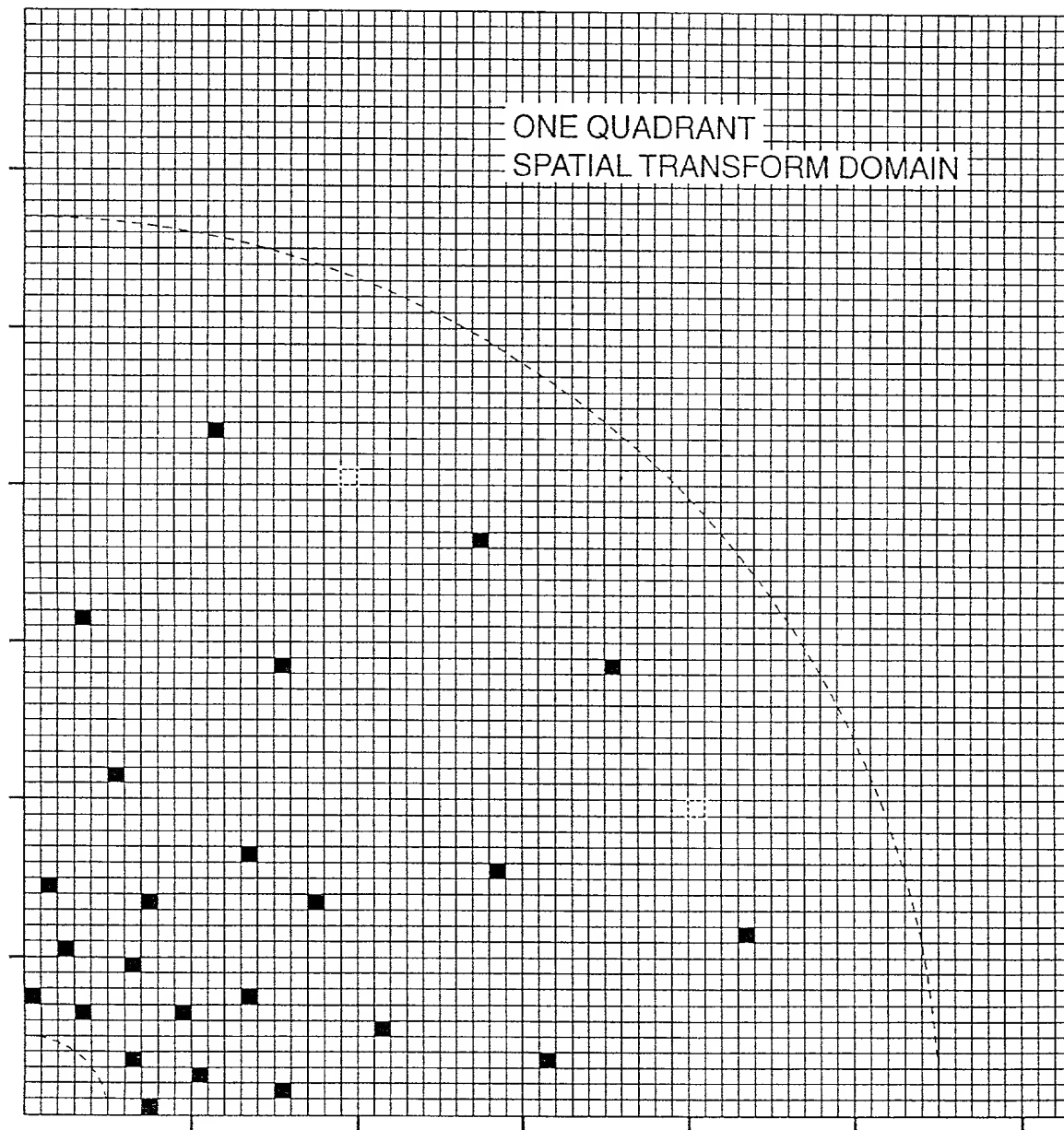
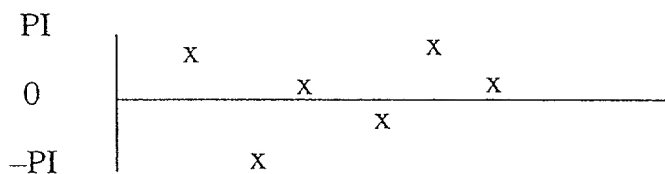
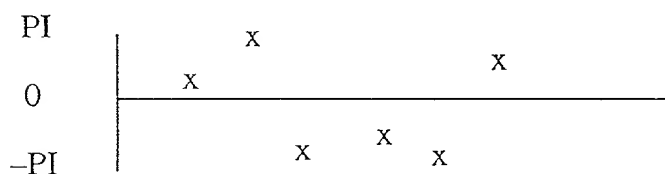


FIG. 31A



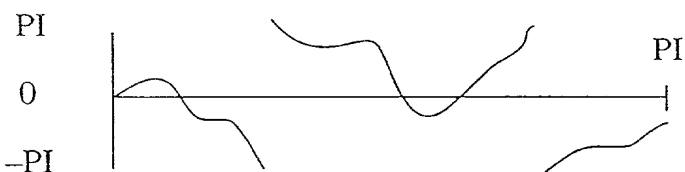
PHASE OF SPATIAL
FREQUENCIES ALONG
FORWARD 45 DEGREE
AXES, 1008

FIG. 31B



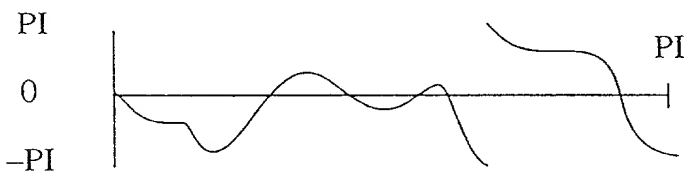
PHASE OF SPATIAL
FREQUENCIES ALONG
BACKWARD 45 DEGREE
AXES, 1010

FIG. 32A



PHASE OF SPATIAL
FREQUENCIES ALONG
FIRST CONCENTRIC RING,
1012

FIG. 32B



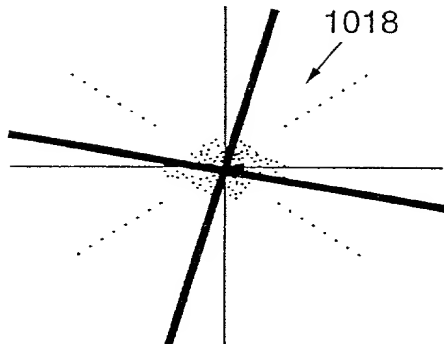
PHASE OF SPATIAL
FREQUENCIES ALONG
SECOND CONCENTRIC RING,
1014

FIG. 32C



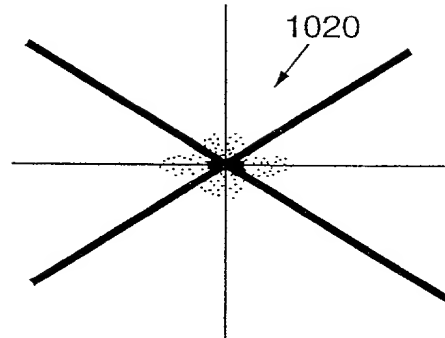
PHASE OF SPATIAL
FREQUENCIES ALONG
THIRD CONCENTRIC RING,
1016

FIG. 33A



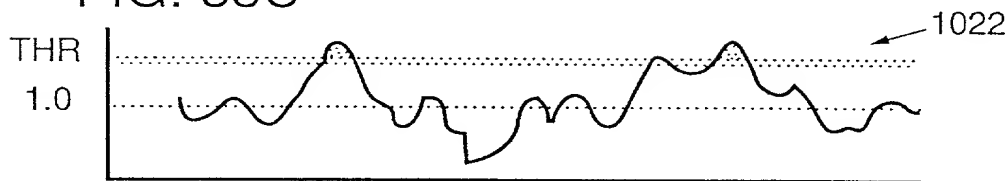
ANGLE A

FIG. 33B



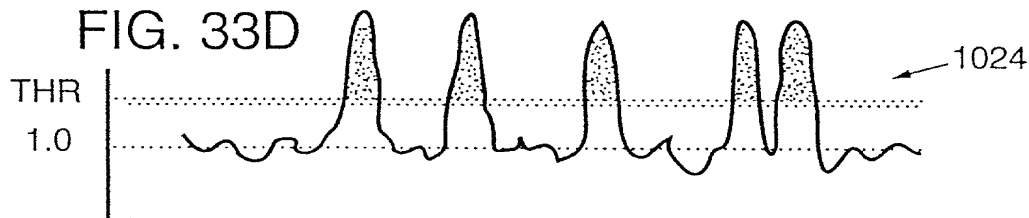
ANGLE B

FIG. 33C



POWER PROFILE ALONG ANGLE A, AS NORMALIZED BY ITS OWN MOVING AVERAGE; ONLY A MINIMAL AMOUNT EXCEEDS THRESHOLD, GIVING A SMALL INTEGRATED VALUE

FIG. 33D



POWER PROFILE ALONG ANGLE B, AS NORMALIZED BY ITS OWN MOVING AVERAGE; THIS FINDS STRONG ENERGY ABOVE THE THRESHOLD

FIG. 33E

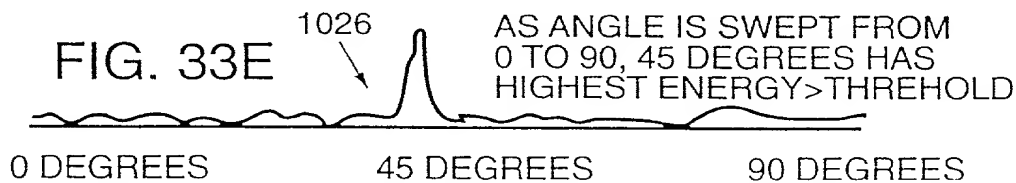


FIG. 34A

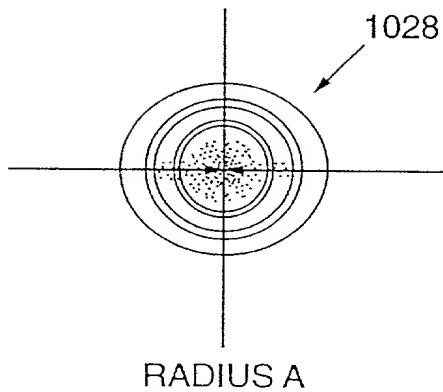


FIG. 34B

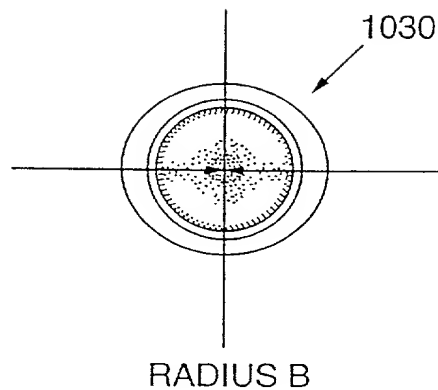


FIG. 34C

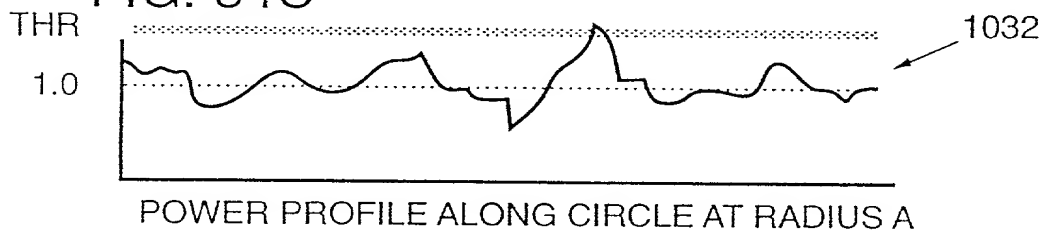


FIG. 34D

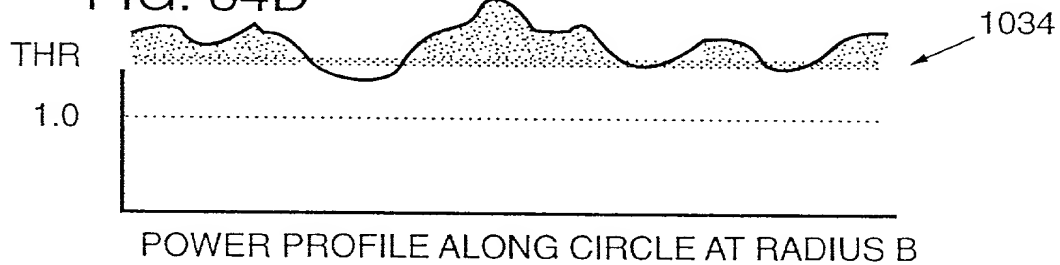


FIG. 34E

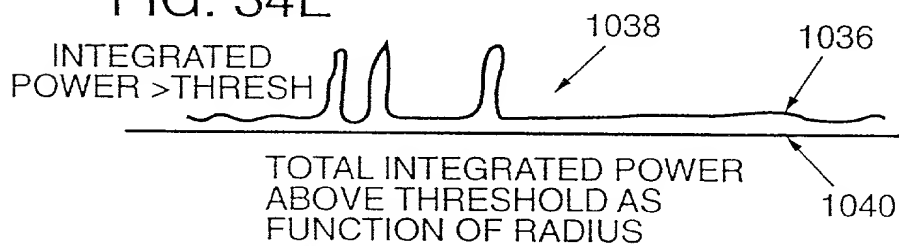
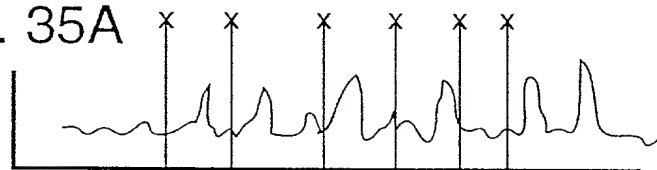
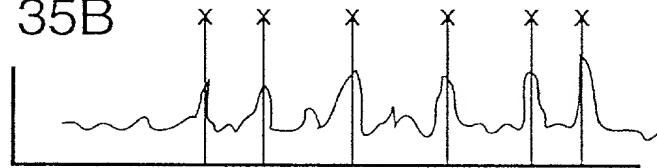


FIG. 35A



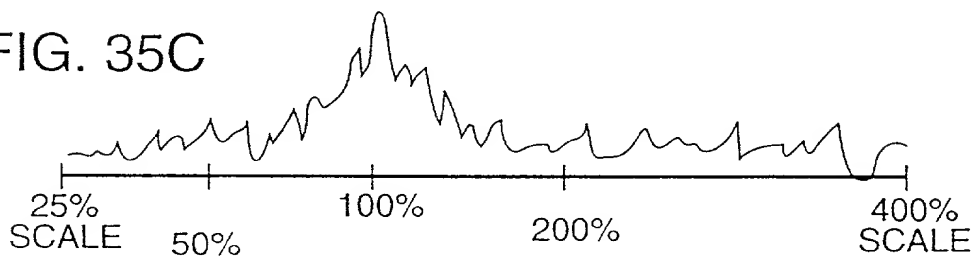
SCALE = A; ADD ALL POWER VALUES AT THE
"KNOWN" FREQUENCIES", 1042

FIG. 35B



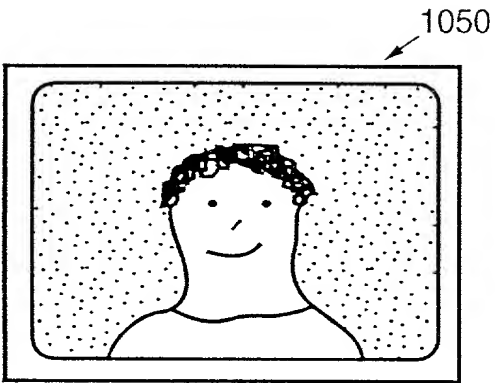
SCALE = B; ADD ALL POWER VALUES AT THE
"KNOWN" FREQUENCIES", 1044

FIG. 35C



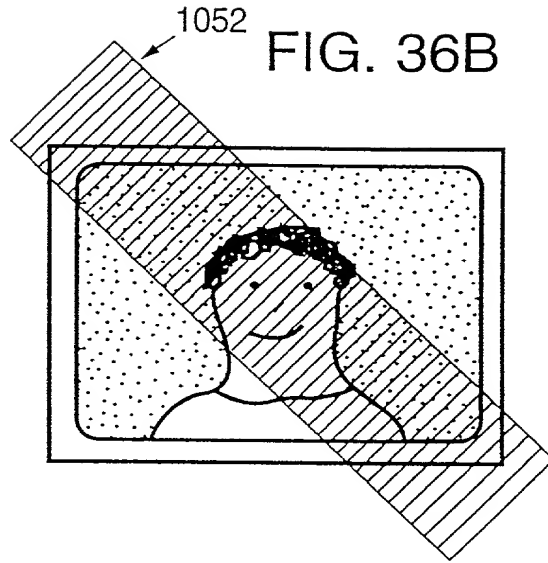
"SCALED-KERNEL" BASED MATCHED FILTER; PEAK IS
WHERE THE SCALE OF THE SUBLIMINAL GRID WAS
FOUND, 1046

FIG. 36A



ARBITRARY ORIGINAL IMAGE
IN WHICH SUBLIMINAL
GRATICULES MAY HAVE BEEN PLACED

FIG. 36B



"COLUMN SCAN"
IS APPLIED ALONG A
GIVEN ANGLE THROUGH
THE CENTER OF THE
IMAGE

COLUMN-
INTEGRATED
GREY
VALUES,
1054

FIG. 36C

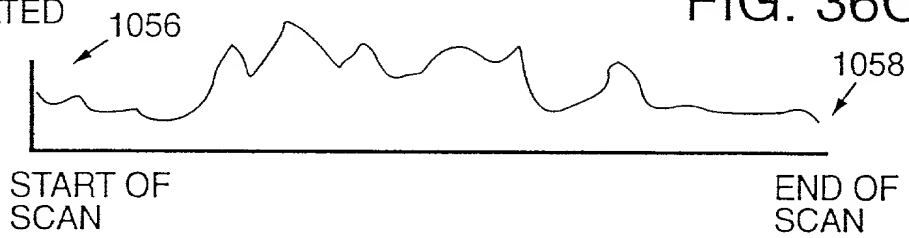


FIG. 36D



MAGNITUDE OF FOURIER TRANSFORM OF SCAN DATA

FIG. 37

PROCESS STEPS

1. SCAN IN PHOTOGRAPH
2. 2D FFT
3. GENERATE 2D POWER SPECTRUM, FILTER WITH E.G. 3X3 BLURRING KERNEL
4. STEP ANGLES FROM 0 DEGREES THROUGH 90 (1/2 DEG)
5. GENERATE NORMALIZED VECTOR, WITH POWER VALUE AS NUMERATOR, AND MOVING AVERAGED POWER VALUE AS DENOMINATOR
6. INTEGRATE VALUES AS SOME THRESHOLD, GIVING A SINGLE INTEGRATED VALUE FOR THIS ANGLE
7. END STEP ON ANGLES
8. FIND TOP ONE OR TWO OR THREE "PEAKS" FROM THE ANGLES IN LOOP 4, THEN FOR EACH PEAK...
9. STEP SCALE FROM 25% TO 400%, STEP ~1.01
10. ADD THE NORMALIZED POWER VALUES CORRESPONDING TO THE 'N' SCALED FREQUENCIES OF STANDARD
11. KEEP TRACK OF HIGHEST VALUE IN LOOP
12. END LOOP 9 AND 8, DETERMINE HIGHEST VALUE
13. ROTATION AND SCALE NOW FOUND
14. PERFORM TRADITIONAL MATCHED FILTER TO FIND EXACT SPATIAL OFFSET
15. PERFORM ANY "FINE TUNING" TO PRECISELY DETERMINE ROTATION, SCALE, OFFSET

FIG. 38

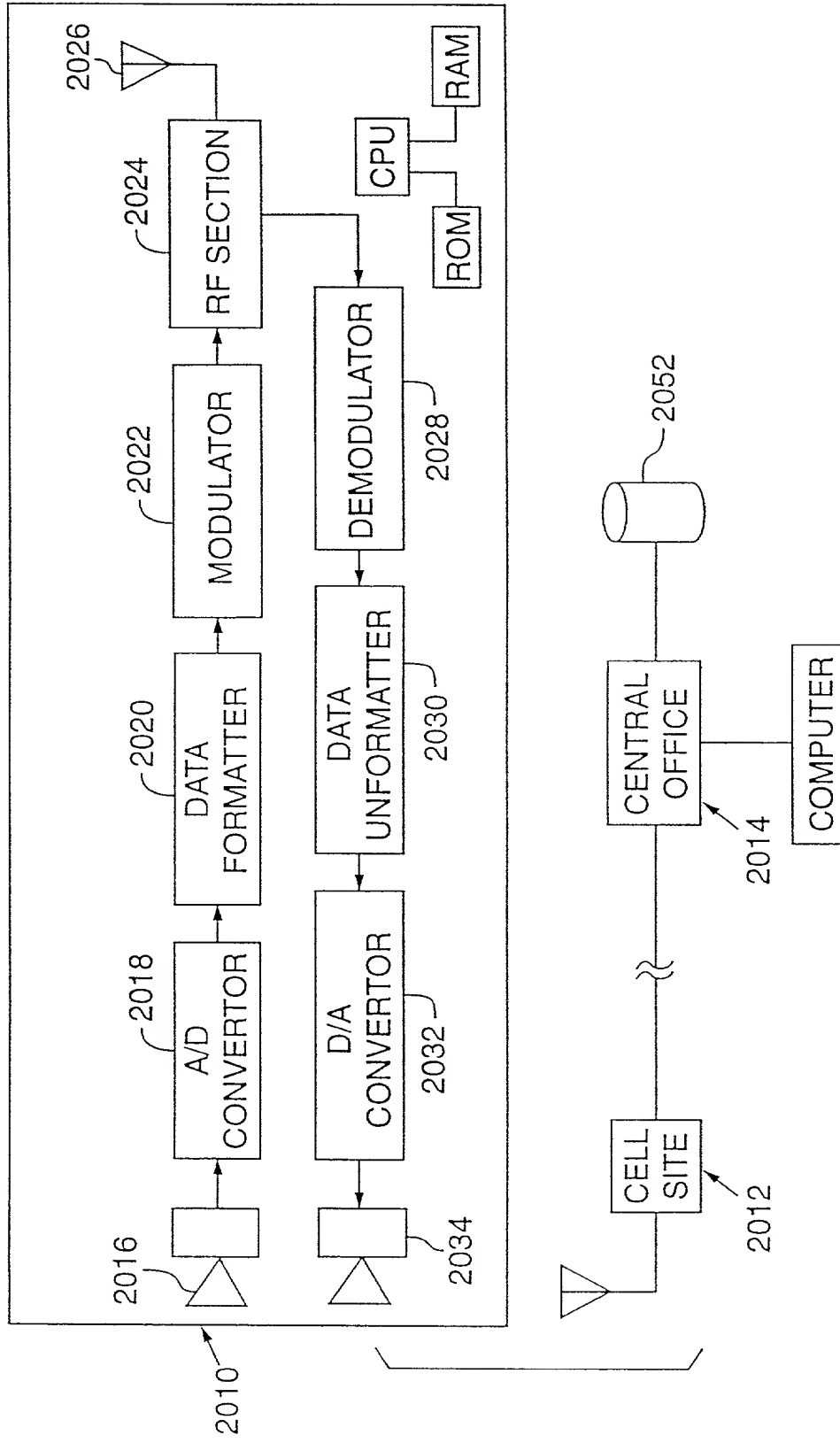
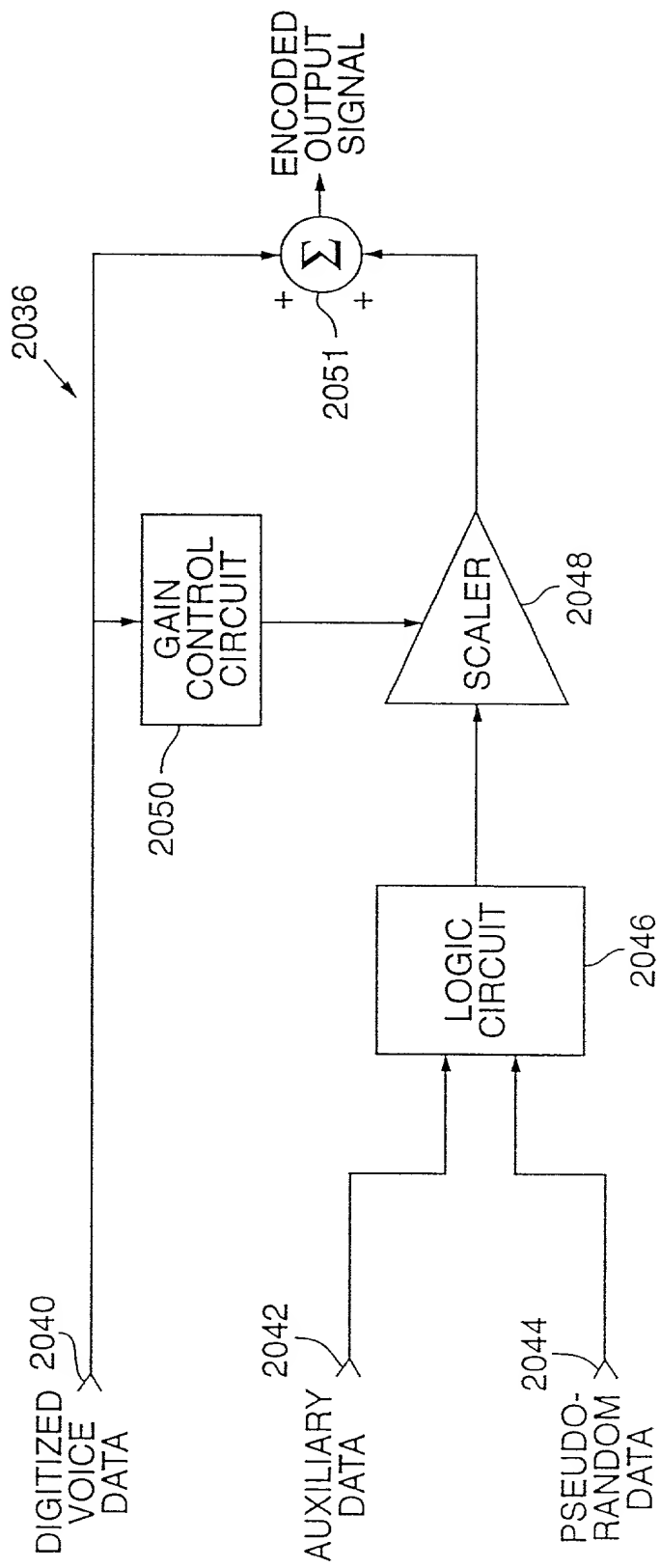


FIG. 39



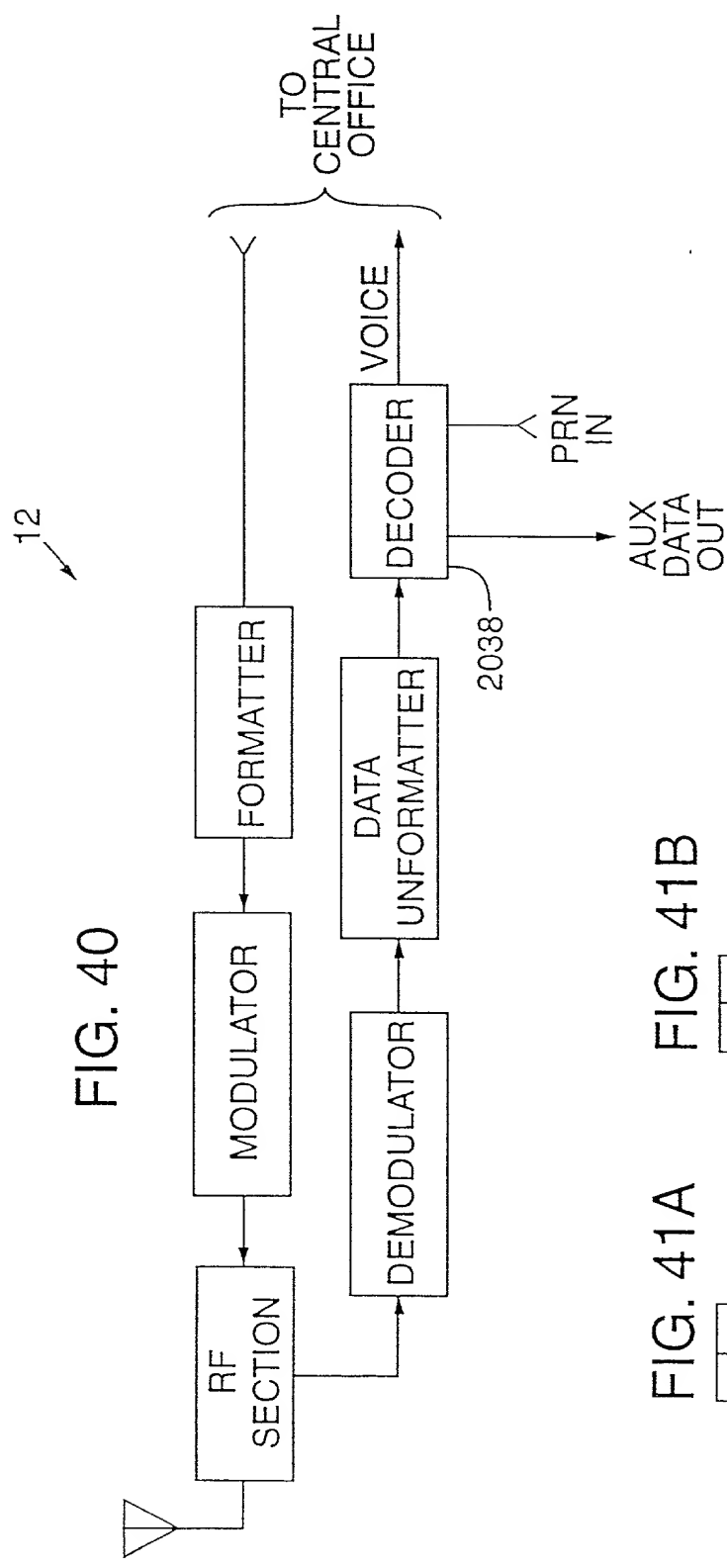


FIG. 40

FIG. 41A

-	+
+	-

FIG. 41B

+	-
-	+

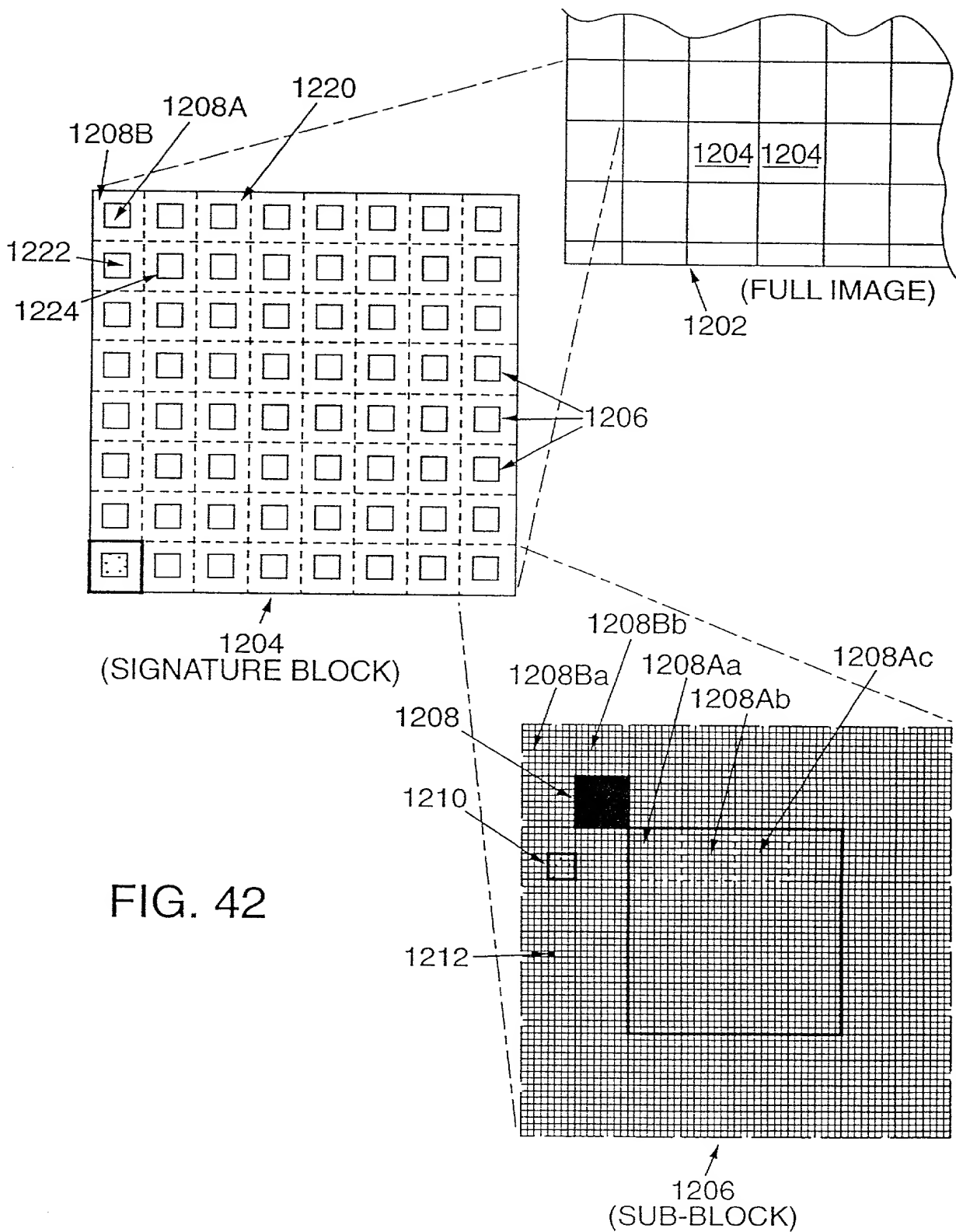


FIG. 42